Using Ontop for semantic transformations to CIDOC-CRM

Florian HIVERT

59th joint meeting of the CIDOC CRM SIG Thursday, 26 September 2024



 Problematic: Transforming an archaeology relational database published on a website into a knowledge graph expressed in CIDOC-CRM (and its compatible model) and querying it on <u>OpenArchaeo</u>.

Publish

←T	'→		\bigtriangledown	SiSePNu	SITE	USNum	Description
	🥜 Éditer	Copier	Supprimer	AJ000005	AJ		Age : adulte (>17 ans) ; Sexe : Masculin ; Positio
	🥜 Éditer	Copier	Supprimer	AJ000002	AJ		Age : adulte (>17 ans) ; Sexe : Masculin ; Positio
	🥜 Éditer	Copier	Supprimer	AJ000021	AJ		Age : indéfinissable ; Sexe : Indéterminé ; Positi
	🥜 Éditer	Copier	Supprimer	AJ000001	AJ		Age : adulte (>17 ans) ; Sexe : Masculin ; Positio
	🥜 Éditer	Copier	Supprimer	AJ000024	AJ		Age : adulte (>17 ans) ; Sexe : Masculin ; Positio
	🥜 Éditer	Copier	Supprimer	AJ000050	AJ		Age : adulte (>17 ans) ; Sexe : Masculin ; Positio
	🥜 Éditer	Copier	Supprimer	AJ000051	AJ		Age : adulte (>17 ans) ; Sexe : Masculin ; Positio
	🥜 Éditer	Copier	Supprimer	AJ000061	AJ		Age : adulte (>17 ans) ; Sexe : Masculin ; Positio
	🥜 Éditer	Copier	Supprimer	AJ000055	AJ		
	🥜 Éditer	Copier	Supprimer	AJ000060	AJ		Age : adulte (>17 ans) ; Sexe : Masculin ; Positio
	🥜 Éditer	Copier	Supprimer	AJ000056	AJ		Age : adulte (>17 ans) ; Sexe : Masculin ; Positio
	🥜 Éditer	Copier	Supprimer	AJ000058	AJ		Age : adulte (>17 ans) ; Sexe : Masculin ; Positio
	🥜 Éditer	Copier	Supprimer	AJ000059	AJ		Age : adulte (>17 ans) ; Sexe : Masculin ; Positio
	🥔 Éditer	Copier	Supprimer	AJ000062	AJ		Age : adulte (>17 ans) ; Sexe : Masculin ; Positio

RECHER	CHE				
Recherche					
Résultats					
Tours_site 17 - Marmo	outier				
Sépulture fouillée par	C. Lelor	ng en 1978. Seuls l	es n	embres inférieurs sont []	
Sépulture 16					Retour à la Fiche du D
Contexte Archéologiq	ue				
Numéro d'inventaire :			0	Phase :	
Numéro Zone :			1	Période :	
Numero US :			0	Groupe Chronologique :	
Numero Pair.			0	Datation individuelle :	HMA
Anthropologie					
Classe d'âge :		adulte (>17 ans)	Position MSO:	77
Sexe : Age :		Masculin		Position MSR:	
Architecture de la ton	ıbe				
Orientation :	90	Contenant :		pleine terre	
Longueur:	0	Remploi contenant :		pas de trace de remploi	
Largeur :	0	Linceul :			



• CIDOC-CRM generic model for OpenArchaeo, representing main concepts in archeology.





C Sem ∞	DpenArchaeo antic web portal MASA+	Home	Explorer	Catalog -	SPARQL (endpoint		
	▼ S Datasets AERBA, ArcheoViz, ArSol,	5 to query Base ICERAMM, Ch	ronique des fouilles en ligne	e, Conservatoire 3D, E	piCherchell, HYDROME	D, Kition-Pervoli	ia, OUTAGR, RITA, SOLIDAR	1 2
	Verduron	~	ArcheoViz	~	ArSol	~	Base ICERAMM	~
	Chronique de fouilles en lig	es v	Conservatoire	3D ~	EpiCherchell	~	HYDROMED	\checkmark
	Kition-Pervol	ia ~	OUTAGR	~	RITA	~	SOLidar	~
	Verduron	~						
							Select/des	elect all
	▼ Q Sparnat	ural explo	orer			<i></i>		
	Load an example query			~	SPARQE Service . <u>Inter</u> s	<u>Jopenarchaeo-gra</u>	phus.numa-num.nnepositonesro	<u>penarchaeo</u>
	Artefact	^					× C	
	Excavation/Dis	scovery						
	Wali							
	Burial			~				
	Archaeological Stratigraphic U	nit	JSON 🚽 Import a query in J	ISON				







OpenArchaeo workflow



- Most of the time, we can't transform the online relational database directly. We
 need to use a SQL dump to clean the data, align it with controlled vocabularies, and
 transform it.
- The result of the mapping is then hosted in the OpenArchaeo triplestore as a version of the dataset expressed in CIDOC-CRM.



OpenArchaeo workflow



 Protégé, with the Ontop plugin, is used solely as a user-friendly interface for producing the mapping. The resulting files are then utilized in <u>Ontop-CLI</u> to generate the Turtle file. In our case, the mapping must adhere to the OpenArchaeo Generic Model presented earlier.



- <u>Protégé</u> allows you to import CIDOC-CRM and its compatible models just like any other ontology that you can work with in the software.
- Its Ontop plugin can query and transform any relational database hosted in a standard SGBD (such as pgSQL, MySQL, MariaDB, etc.) when provided with the appropriate driver and configuration. You can even host Virtual RDF Graphs of your relational database based on your mapping.
- Ontop uses the R2RML mapping syntax, which is similar to Turtle syntax. It is easy to use for users who are already familiar with this syntax.
- Protégé and Ontop are Open-Source.



depicherchell (http://www.semanticweb.org/hivert/epicherchell) : [C:\Users\fhivert\Documents\OpenArchaeo	\openarchaeo-mapping\Mapping-EpiCherchell_Ontop\EpiCherchell_0	Ontop_Mapping.owl]	- 🗆 ×		
File Edit View Reasoner Tools Refactor Window Ontop Help					
epicherchell (http://www.semanticweb.org/hivert/epicherchell)			- Q		
) Entité CRM) S15_Observable_Entity) Entité persistante) Chose) Chose fabriquée) Chose matérielle fabriquée) Objet fa	abriqué				
Active ontology × Entities × Individuals by class × DL Query × Ontop Mappings ×					
Classes Object properties Data properties Annotation properties Datatypes Individuals	= Objet fabriqué — http://www.cidoc-crm.org/cidoc-c	rm/E22_Man-Made_Object			
Class hierarchy: Objet fabriqué	Annotations Usage				
t‡ t\$, ⊠ ☉ Asser	rted - Annotations: Objet fabriqué				
T- owt: Thing	Annotations 🕀			a Anna Rabina Ing Anna Anna Anna A	
Collection (skos:Collection)	rdfs:label [language: fr]	** epicherchell (http://www.semanticweb.org/hivert/epicherchell) : [C:\Users\fnivert\Documents\OpenArchaeo\open	openarchaeo-mapping\Mapping-tpiCherch	ell_Ontop\tpit_herchell_Ontop_Mapping.owlj	
Concept Scheme	Objet fabriqué	File Edit View Reasoner Tools Refactor Window Ontop Help			
	rdfs:label [language: en] Man-Made Object	epicherchell (http://www.semanticweb.org/hivert/epicherchell)			-Q
Entité CRM Dimensions	referabel flanemane shi) est composée de			
	人造物件	Active ontology × Entities × Individuals by class × DL Query × Ontop Mappings ×			
Agent	rdfs:label [language: el]	Classes Object properties Data properties Annotation properties Datatypes Individuals	≡ ■ est composée de — http://v	www.cidoc-crm.org/cidoc-crm/P46_is_composed_of	
The second secon	Ανθρωπογενές Αντικείμενο	Object property hierarchy: est composée de	Annotations Usage		
Période	rdfs:label [language: ru]	TI E, X O Asserte	Annotations: est composee de		
Etat matériel	Рукотворный Объект	BP13_used_specific_object BP13i was specific object used by	Annotations 😳		000
S20_Physical_Feature	ransclabel [language: pt] Objeto Fabricado	BP14_re-used_specific_object	est composée de		000
▼ - S15_Observable_Entity ▼ - Entité persistante	rdfs:label [language: da]	BP15_is_equal_to	rdfs:label [language: en]		@xo
Agent	Künstlicher Gegenstand		is composed of		
Collectivité	rdfs:comment [language: en]	BP1i_has_section	rdfs:label [language: el]		080
	This class comprises physical objects purposely create No assumptions are made as to the extent of modificat	BP2_is_constituted_by	αποτελείται από		
Chose fabriquée Chose matérielle fabriquée	Description: Objet fabriqué		rdfs:label [language: zh]		080
B1_Built_Work	осастрион. соци налицие	BP4_terminates_the_constituency BP4i constituency was terminated by	sticulated . Danausana att		000
B3_Filled_Morphological_Building_Section	Equivalent To	BP5_initiates_the_constituency	é composto de		000
Collection	SubClass Of		rdfs:label [language: ru]		000
Support d'information	Chose matérielle fabriquée		составлен из		
Objet conceptuel Objet juridique	Objet matériel*	commence	rdfs:label [language: de]		080
S10_Material_Substantial	General class axioms		ist zusammengesetzt aus		
T Période		consiste en ▶── contient	rdfs:comment [language: en] This property allows instances	of F18 Physical Thing to be analysed into component elements	000
V → U Evénement	SubClass Of (Anonymous Ancestor)	curated	This property allows instances	or El to migaican ming lo de analyseu mo component elementa.	
Début d'existence			Characteristics: est c 2 2 2 2	Description: est composée de	
► S18_Alteration	instances 😈	← defines typical wholes for → droit détenu par	Functional	Equivalent To 🕀	
A7_Embedding	Target for Key	définit une section de	Inverse functional		
Etat matériel		est actuel ou ancien membre de	Transitive	SubProperty Of 🕀	
Spacetime Volume Source R1 Point Work	Disjoint With	est actuellement localisation à demeure de est arrivé en présence de	Symmetric	Inverse Of 🕀	
B2_Morphological_Building_Section	Disjoint Union Of		Asymmetric		
Chose matérielle Enactéristique matérielle		est composé de	Palavia	Domains (intersection)	
Chose matérielle fabriquée Objet matériel		► est de type		Chose matérielle	0000
520_Physical_Feature		est détenteur de	irrenexive	Ranges (intersection)	
		est détenu par		Chose matérielle'	0080
V - 0 I5_Inference_Making A6_Group Declaration Event					
Label		irrel est identifiée par est immédiatement précédé par		Disjoint With	
▼- S4_Observasion		est l'unité de		SuperProperty Of (Chain)	
A9_Archaeological_Excavation		- est la langue de			
		⊫r- == est le type de ⊪r- == est ou a été détenteur de			
		est ou a été détenu par set ou a été la résidence de			
		▶ = est ou a été localisation de			
		► est ou a été propriétaire de			
		est partiellement recouverte dans le temps par			
		▶ = est référencé par			
		- est sejet e			
		est terminée par			
		⊨			
		r Infait partie de In Infait référence à			
		figure			
		had processes			
		had presence had scomponent			
		had presence has component has member has member ist			
		had presence has component has member has member has member has member has member has member			



🔻 untitled-ontology-51 (http://www.semanticweb.org/flohi/ontologies/2023/5/untitled-ontology-51) : [http://www.semanticweb.org/flohi/ontologies/2023/5/untitled-ontology-51]

File Edit View Reasoner Tools Refactor Window Help

Intitled-ontology-51 (http://www.semanticweb.org/flohi/ontologies/2023/5/untitled-ontology-51)

Active ontology × Entities × Individuals by class × DL Query ×

Ontology header:		Image: Image
Ontology IRI http://www.semanticweb.org/flohi/ontologies/2023/5/untitled-ontology-51		Metrics
Ontology Version IRI e.g. http://www.semanticweb.org/flohi/ontologies/2023/5/untitled-ontology-51/1.0.0		
	🛃 Automatic Update	al axiom count
Annotations		ration axioms count
	Install Name Current version	Available version count
	OBO Annotations Editor	t property count
	Optology Abstraction Ecomowerk (OAE)	roperty count
	Ontology Abstraction Framework (OAF)	lual count
	Ontonoldy Debudder (OntoDebud)	ation Property count
		3.0.2
	OWL Dillefence	xioms
		assOf
	Ballet Bessener Blue in	alentClasses
	Prenetical DemoinClose	ntClasses
	PropertiesInDomaniciass POMU : SMPL Bula to OML Aviam Converter	bunt
	ROWL SWRL Rule to OWL Axion Converter	n GCI Count
	SHACL4Protege Constraint Validator	
		5.0.0 broperty axioms
	SRE Plugin	j.2.1 bjectPropertyOf
	SWRLTAD Plugin 2.0.10	alentObjectProperties
	Author:	eObjectProperties
		ntObjectProperties
	License:	onalObjectProperty
		eFunctionalObjectProperty
Ontology imports Ontology Prefixes General class axioms		
Imported ontologies:		
Diract Imparte		
Indirect imports	Always sheek for undetee on status	
	Always check for updates on startup.	
	Install Not now	



Chiper server is in finite unit by class 10. Comp (they Mapping) Construction (DR): Datasets or manager (Mapping manager) Image: Construction (DR): Connection (DR): Determine: Connection (DR): Database teamane: Database teamane: Jubbase teamane: Database teamane: Jubase teamane: Database team	
Attendence in the index by class IL Course Origon parameters Costs Anderectory Costs Anderectory Contrection parameters Contrection parameters Databases exeraments Databases exeraments Database exeraments Databases exeraments Databas	
Class before Dissource manager Mapping manager Image: Im	
Celect paperty herachy Data paperty herachy Rendering of the connection Celect paperty herachy Rendering of the connection Rendering of the connection Celect paperty herachy Rendering of the connection Rendering of the connection Celect paperty herachy Rendering of the connection Rendering of the connection Celect paperty herachy Rendering of the connection Rendering of the connection Celect paperty herachy Rendering of the connection Rendering of the connection Celect paperty herachy Rendering of the connection Rendering of the connection Celect paperty herachy Rendering of the connection Rendering of the connection Celect paperty herachy Rendering of the connection Rendering of the connection Celect paperty herachy Rendering of the connection Rendering of the connection Celect paperty herachy Rendering of the connection Rendering of the connection Celect paperty herachy Rendering of the connection Rendering of the connection Celect paperty herachy Rendering of the connection Rendering of the connection Celect paperty herachy Rendering of the connection Rendering of the connection Celect paperty herac	
 ▶ • out thing Connection URL: Backase usernam: Database passed: Database passed: Database passed: Dec dire class: In the connection URL: Backase usernam: Database passed: Dec dire class: In the connection URL: Backase usernam: Database passed: In the connection URL: Backase usernam: In the connection URL: Backase usernam: Database passed: In the connection URL: Backase usernam: In the connection URL: In the conneconnection URL: In th	
Contection UK: jpt: cm;rgd:diractile/tit_ges/dathTite@eba/uc-CONTERT_TO_NULL&serrefTimezos=LifCoSession/usables.sd],moder:AUSTAseSCursoF4d:h4us4dsHulf#AbSlase Database passwer: Database passwe	
Object property heraccty Otheractory Object property heraccty Otheractory Image: Constraint Assended >> = owttopObjectProperty	,0
Dubases possibili JDBC driver class: © em.mysql cj jdbc. Driver © T test Connection © T test Connection	
Object property hierarchy Annotation property hierarchy Object property hierarchy Image: Comment of the section Time Comment of the section Assetted =	
Object property hierarchy Annotation property hierarchy Object property hierarchy Direco Spect property hierarchy Direco Mark Assented - > = costtopObjecProperty Assented -	•
Object property hierarchy Data property hierarchy Object property hierarchy 211=00 The Description of the Descri	
Object property hierarchy Data property hierarchy Object property hierarchy OTHERIN The main of the main	
Object property hierarchy Data property hierarchy Coject property hierarchy Crimeino The Dial Asserted The Own top Object Property Asserted	
Object property hierarchy Data property hierarchy Object property hierarchy QII=010 Time in the local state of t	
Object property hierarchy Data property hierarchy Object property hierarchy ITHEON Image:	
Object property hierarchy Data property hierarchy Object property hierarchy OTHERS The Color Asserted The Color Asserted	
Object property hierarchy Data property hierarchy Object property hierarchy DTmmb Image: I	
Object property hierarchy Data property hierarchy Annotation property hierarchy Object property hierarchy R211=000 *** *** Asserted • > = owttopObjectProperty ***	
Object property hierarchy: Climex Image: Comparison of the second of the sec	
Asserted • > owttopObjectProperty	
▶ ■ owitopObjectProperty	



	CIDOCforArSol (http://www.sema	nticweb.org/marlet/CIDOCforArSol) : [C:\Users\fl	hivert\Documents\OpenArchaeo\openarchaeo-mapping\Mapping-ArSol_Ontop\ArSol_Ontop_Mapping.owl]	- 🗆 X
	File Edit View Reasoner To	ools Refactor Window Ontop Help		
	< > CIDOCforArSol (http://www.cidence.com/arsol/arso	p://www.semanticweb.org/marlet/CIDOCforAr	Sol)	• Q
Control Control <t< td=""><td>Active ontology × Entities × Indi</td><td>ividuals by class × DL Query × Ontop Ma</td><td>ppings *</td><td></td></t<>	Active ontology × Entities × Indi	ividuals by class × DL Query × Ontop Ma	ppings *	
best to be the set of the se		Asserted 👻	Connection parameters Untop properties Mapping manager Mapping editor:	
Description Construction Construction </td <td>owl:Thing</td> <td></td> <td></td> <td>Select all Select none</td>	owl:Thing			Select all Select none
A set of the set of				
SEECT 58: (b): (b): 0: operation j and: (oraclij b): MAGE_j isoperation j and (b): (b): (b): (b): (b): (b): (b): (b):			arsoliske[Site]#Decouverte a sci:S19_Encounter_Event ; crm:P8_took_place_on_or_within arsoliske[Site] ; crm:P14_carried_out_by <{HAL}> ; crm:P2 crm:P7_took_place_at <[geoname]> .<[artk]> a crm:E55_Type ; crm:P2 is_type of arsoliske[Site]#Decouverte ; skostxilatilabel <[aitLabel]> . <[aitLabel]> .<[aitLabel]>	_has_type <{ark}> ; el}> a skosxi:Label ; :couverte . <{HAL}> a kos:prefLabel
bit bit problem bit problem <t< td=""><td></td><td></td><td>SELECT s.Site, s.HAL, s.operation, p.ark, concat(p.ark, "#ArSol_", s.operation) as altLabel, s.geoname as geoname, s.localisation as localisation FROM sites as</td><td>s INNER JOIN pactols</td></t<>			SELECT s.Site, s.HAL, s.operation, p.ark, concat(p.ark, "#ArSol_", s.operation) as altLabel, s.geoname as geoname, s.localisation as localisation FROM sites as	s INNER JOIN pactols
Bit paperty humaby Anotating paperty humaby Destage of the Constant			Site arsoliskle(Site) a cm:E27_Site ; skos:prefLabel {label}*xsd:sting ; cm:P81_witnessed arsoliskle(Site)#Decouverte ; cm:P48_has_preferred_identifier arsoliskle(Site)#identifiant. arsoliskle(Site)#identifiant a cm:E42_identifier ; cm:P48_is_preferred_identifier_of arsoliskle(Site) ; rdfs:label {Site}*xsd:sting : arsoliskle(Site)#Decouverte a sci:S19_Encounter_Event ; skos:prefLabel {label_dec}*xsd:sting .	ring .
Augustability Augustability<			SELECT Site, Nom, localisation, geoname, REPLACE(Nom, '_,' - ') AS label, concat('Fouille de ', Nom) as label_dec FROM sites WHERE Nom <> " AND localisati geoname <> "	tion <> " AND
Bit Bit C T Site, Responsable, H-L, Institution PROM sites WHERE Responsable -* "ALD Institution -*: File Diagonget Namestry Comparing Sites Sit			Responsable <{viai_institution}> a cm:E74_Group : skos:prefLabel {Institution}*vsd.string : cm:P48_has_preferred_identifier <{Web}> : cm:P107_has_current_0 <{HAL}> . <{Web}> a cm:E42_identifier : cm:P48_is_preferred_identifier_of <{viai_institution}> ; rdfs:label {Web}*vsd.string . <{HAL}> a cm:E12_Pe skos:prefLabel {Responsable}*vsd.string : cm:P107_is_current_or_former_member_of <{viai_institution}> .	pr_former_member irson ;
File andstatic [site]/decourde a scills_production for some skills_production with a sense skills_production for some skills_production f			SELECT Site, Responsable, HAL, Institution, Web, viaf institution FROM sites WHERE Responsable <> " AND Institution <> "	
<pre>show the section of the section</pre>			Faits	
Data property herarchy Collect property herarc			arsoliste/Stie/#Decouverte a sci:S19_Encounter_Event; sci:D19_has_found_object arsolital(ShlurFal)_pactols:ark:/28678/crtyuEo454GyD a crm:E32 crm:P2i_is_type_of arsolital(ShlurFal); skosxtalitLabel pactols:ark:/28678/crtyuEo454GyDIArsol_Fait, pactols:ark:/28678/crtyuEo454GyDIArsol_Fait skosxtilteralForm Traff**xds.timg; dcierms:source *ArSol_**xds.timg, arsolital(ShlurFal) a crm:E32_Man-Made_Fautre; sci:D19_wag_object_fou arsoliste(Stie)#Decouverte; crm:P2_has_type pactols:ark:/28678/crtyuEo454GyD : crm:P48_has_preferred_identifier arsolital(ShlurFal)# (DescrFalf**xds.timg; sci:PrefLabe(Ideb)**xds.timg; arsolital(ShlurFal) a crm:E32_Man-Made_Fautre; crm:P48_is_preferred_identifier of arso	_Type; a skosxl:Label; and_by m:P3_has_note bl:ifait{SiNuFai};
Object property instructivy CASE Object property instructive Asserted Image: Case Image: Case Image: Case	Data property hierarchy	Annotation property hierarchy	rdfs:label {SiNuFai}^xsd:string . SELECT [SiNuFai Site Fait nom DescrFait	
Object y product interaction Class End of Status Object y product interaction Asserted ELSE CONCAT(Frait : (SNUFa) END As label END on the status From Mist As I NIERE JOIN sites As 5 on I Site = s Site WHERE I SNUFai (SnuFai (SnuFai (SnuFai)) END Asserted Murs assolitate(Site)/Decouverte sciO19 has found object aronimurs(SiNuMur) , pactols:aric/26678/portix-htmb/Wo/YWW/arol. Mur a skostiLabel ; skostiliteralForm Mur ⁻ skd sting : decremesource *ARSOL**skd sting : astolimurs(SiNuMur) = acm:25, Man-Made, Feature ; cmmP2 has type of aronimurs(SiNuMur) ; skostiliteralForm Mur ⁻ skd sting : decremesource *ARSOL**skd sting : astolimurs(SiNuMur) = acm:26, Man-Made, Feature ; cmmP2 has type intered (dentifier and intered (dentifier astolimurs(SiNuMur) = acm:24, Jeentifier ; skostiliteralForm Mur ⁻ skd sting : decremesource *ARSOL**skd sting : astolimurs(SiNuMur) = acm:26, Man-Made, Feature ; cmmP2 has type intered (dentifier astolimurs(SiNuMur) = acm:24, Jeentifier ; skostiliteralForm Mur ⁻ skd sting : decremesource *ARSOL**skd sting : astolimurs(SiNuMur) = acm:24, Jeentifier ; skostiliteralForm Mur ⁻ skd sting : decremesource *ARSOL**skd sting : astolimurs(SiNuMur) = acm:24, Jeentifier ; skostiliteralForm Mur ⁻ skd sting : decremesource *ARSOL**skd sting : astolimurs(SiNuMur) = acm:24, Jeentifier ; cmmP4 has preferred (dentifier of aronimurs(SiNuMur) * skd sting : astolimurs(SiNuMur) = acm:24, Jeentifier ; cmmP4 has preferred (dentifier of aronimurs(SiNuMur) * skd sting : astolise(Site)/Decouverte : cmmP2 has type partolsark/26878/pert78bab20mw = cmm250, Man-Made, Feature : cmmP2 has type partolsark/26878/pert78bab20mw = cmm250, Man-Made, Feature : cmm21, Jiss note (December)/skd sting : astolise(Site)/Decouverte : cmmP4 has preferred (dentifier astolise)/Sisephul) astolise(Site)	Object property hierarchy		CASE	
■ ovttopObjedProperty FROM tals bein FROM tals AS \$ S ON 158 ters Site ■ ovttopObjedProperty FROM tals AS \$ NURER JOIN sites AS \$ S ON 158 ters Site WHERE 15NUF#1 ↔ " FROM tals AS \$ NURER JOIN sites AS \$ S ON 158 ters Site WHERE 15NUF#1 ↔ " murs arsolinus(Site)ProcessitalLabel partols::ark/28678/port1xHmbVvOVW.as cmm251, hap to is: ark/28678/port1xHmbVvOVW.as cmm251, hap to is: ark/28678/po	Tt C M O		WHEN f.Fait_nom <>" THEN CONCAT(f.Fait_nom,' (',f.SiNuFai,')') ELSE CONCAT('Fait ',f.SiNuFai)	
Murs arsolishie(Site)#Decouverte scl:019_has_found_object arsolimurs(SiNuMur)_pactols:ark/28678/pcrttXHmbVwDYWarSol_Mur assoxtLabel; siskimurs(SiNuMur); skoxstAllabel pactols:ark/28678/pcrttXHmbVwDYWWArSol_Mur acmitES5_Type; cmr:P2i_is_type_of arsolimurs(SiNuMur); skoxstAllabel pactols:ark/28678/pcrttXHmbVwDYWWArSol_Mur acmitES5_Type; cmr:P2i_is_type_of pactols:ark/28678/pcrttXHmbVwDYWW; cmr:P2_has_note (Description)*xds timg; cmr:P48_has_preferred_identifier; arsolimurs(SiNuMur); acmitES5_Type; cmr:P42_has_type pactols:ark/28678/pcrttXHmbVwDYW; cmr:P2_has_note (Description)*xds timg; cmr:P48_has_preferred_identifier; cmr:P48_has_preferred_identifier; cmr:P48_has_preferred_identifier; cmr:P48_has_preferred_identifier; cmr:P48_has_preferred_identifier; cmr:P48_has_preferred_identifier; cmr:P48_has_preferred_identifier; cmr:P48_has_has_has SELECT m_SNuMur, mSile, mDescription CNCACK/(Mur' in SNUMUr) is cmr:P2 is as is as is as is as a site most and more site most as an association accord and accord as a site most association accord as a sociation accord as a site most association accord association accord as a sociation accord association accord associat	owl:topObjectProperty		END As label FROM faits AS INNER JOIN sites AS s ON 1.Site = s.Site WHERE 1.SINUFai ⇔ *	
			Murs arsolisle(Site)#Decouverte sci:O19_has_found_object arsol:murs(SiNuMur) . pactols:ark:/26678/pcrttxHmbVwDYW a cm:E55_Type ; cm:P2i_is_type_arsol:murs(SiNuMur) ; skosxi:altLabel pactols:ark:/26678/pcrttxHmbVwDYWArSol_Mur a skosxiLskost.pdf skosxi:ters.form *Mur*wsi:source *ARSOL**xsdsting, actomics.gov arsol:murs(SiNuMur) ; cm:E25_Man-Made_Feature ; cm:P2_is_type_actols:ark:/26678/pcrttxHmbVwDYWWArSol_Mur a skosxiLskost.pdf skosxi:ters.form *Mur*wsi:source *ARSOL**xsdsting, actomics.gov arsol:murs(SiNuMur) ; cm:E25_Man-Made_Feature ; cm:P2_is_type_pactols:ark:/26678/pcrttxHmbVwDYW ; cm:P3_has_note (Description)*xsd string ; cm:P44_has_preferred_identifier arsol:murs(SiNuMur)#identifiant a cm:E42_identifier ; cm:P48_is_preferred_identifier arsol:murs(SiNuMur); irdfs:label (SiNuMur)*xsd string ; sto:Dist_Murs(SiNuMur)#identifiant a cm:E42_identifier ; cm:P48_is_preferred_identifier as a skosxi.pdf SELECT m.SNuMur, m. Site, m Description, come is skosymeth.abel (BabP)*vsd string ; sto:Dist_Murs(SiNuMur)#identifiant a cm:E42_identifier ; cm:P48_is_preferred_identifier as a skosxi.pdf FROM murs AS m, sites AS s WHERE m Site = s.Site AND m.StructNum <> AND m.Site 'AND m.Description Sepultures arsol:isle(Site)#Decouverte sci:D19_has_found_object arsol:sepu(SiSepNu)_arsol:sepu(SiSepNu)_a cm:E25_Man-Made_Feature ; cm:P2_has_type_pactols:ark:/26678/pcrt795b632nWw is cm:E35 cm:#24_is_preferred_identifier asol:sepu(SiSepNu)#identifiant; skoss;prefLabel (IdabPi*xsd string_actors.ark:/26678/pcrt795b632nWw is cm:E35 cm:#24_is_preferred_identifier asol:sepu(SiSepNu); rdfs:label (SiSepNu)*identifiant a cm:E42_identifi	of ibel; ;
	Offerenda		misphang size. 21 Search (any on)-	



Florian HIVERT, 59th CIDOC-CRM & 52nd FRBR/LRMoo SIG Meeting

🛃 Edit	Triples	Map											×			
/lappin	ig ID:	Site														
arget	(Triple	s Template):														
arsol:i arsol:i { Site }	isite{ S isite{ S ^^xsd:	Site} a crm:E27 Site}#Identifiant string . arsol:isi	_ <mark>Site ; sko</mark> . arsol:isite te{ Site }#De	s:prefLabel {la {Site}#Identifian couverte a sci:	bel} [^] xsd:strin t a crm:E42_lo S19_Encount	g ; crm:P8i_w dentifier ; crr er_Event ; sk	ritnesse n:P48i_ cos:pref	ed arsol:isite{Site is_preferred_id fLabel {label_de	<pre>#Decouverte lentifier_of ar ec}^^xsd:string</pre>	; crm:P48 sol:isite{Sin	_has_pret te} ; rdfs:l	ferred_id abel	entifier			
Source	(SQL	Query):														
SELE(CT Sit ation	te, Nom, localisa <> " AND geon	ation, geona ame <> "	ame, REPLACE(Nom, '_', ' - ') /	AS label, conca	at('Fouil	le de ', Nom) <mark>as</mark> la	abel_dec FRO	M sites WI	IERE Nom	<> " AND				
QL Q	uery re	esults:														
		Site		Nom	localis	ation		geoname	lat	pel		label_dec				
AA Al			Tours_site 3 Tours_site 1	- Château de T 6 - Saint-Julien	Tours Tours	ht ht	ttps://sws ttps://sws	.geonames.org/2 .geonames.org/2	Tours - site 3 - 0 Tours - site 16 -	Château de T Saint-Julien	Fouille d Fouille d	e Tours_site e Tours_site	3 - Ch 16 - S			
4J 7V			Tours_site 1 Chinon_Fort	7 - Marmoutier	Tours	ht	ttps://sws	.geonames.org/2	Tours - site 17 -	Marmoutier	Fouille d	e Tours_site	17 - M			
ZY			Chinon_Coll	égiale_St-Mexme	Chinon	ht	ttps://sws	.geonames.org/3	Chinon - Collég	iale - St-Mex	Fouille d	e Chinon_C	ollégial			
ZZ			Rigny-Ussé_	Rigny 1	Rigny-Ussé	ht	ttps://sws	.geonames.org/2	Rigny-Ussé - Ri	igny 1	Fouille d	e Rigny-Uss	é_Rign			
<i>ቆ</i> ₽ E	xecute	e the SQL querv	(100 rows)													
			. ,									Update	Annuler			
Site	Num	Nom	Responsable	HAL	Institution	viaf_institution		Web		localisation	geoname		operation	datedeb	datefin	datelitt
AA	3	Tours_site 3 - Château de Tours	Henri Galinié	https://halshs.archives- ouvertes.fr/search/inde	Laboratoire Archéologie et x/q Territoires (CNRS/Unive	http://viaf.org/viaf/14	18015028 1	http://citeres.univ-tours.fr/l	at	Tours	https://sws.geo	names.org/2972	191/ Fouille programmée	1974	1978	juin 197 oct. 197
AI	16	Tours_site 16 - Saint- Julien square Prosper														
		Mérimé	Henri Galinié	https://halshs.archives ouvertes.fr/search/inde	- Archéologie et ex/q Territoires (CNRS/Unive	http://viaf.org/viaf/14	180150288 1	http://citeres.univ-tours.fr/l	at	Tours	https://sws.geo	names.org/2972	191/ Fouille programmée	2000	2003	2000- 2003
AJ	17	Mérimé Tours_site 17 - Marmoutier	Henri Galinié Elisabeth Lorans	https://halshs.archives ouvertes.fr/search/inde https://halshs.archives ouvertes.fr/search/inde	Laboratoire Archéologie et ix/q Territoires (CNRS/Unive Laboratoire Archéologie et ix/q Territoires (CNRS/Unive	http://viaf.org/viaf/14 http://viaf.org/viaf/14	180150288 18015028	http://citeres.univ-tours.fr/l. http://citeres.univ-tours.fr/l.	at	Tours Tours	https://sws.geo https://sws.geo	names.org/2972 names.org/2972	191/ Fouille programmée 191/ Fouille programmée	2000	2003 2020	2000- 2003 2004- 2020
AJ ZX	17	Mérimé Tours_site 17 - Marmoutler Chinon_Fort-St- George	Henri Galinié Elisabeth Lorans Bruno Dufaÿ	https://halshs.archives ouvertes.fr/search/inde https://halshs.archives ouvertes.fr/search/inde https://halshs.archives ouvertes.fr/search/inde	Laboratoire - Archéologie et (CNRS/Unive Laboratoire - Archéologie et xx/q Territoires (CNRS/Unive SADIL - Département 37	http://viaf.org/viaf/14 http://viaf.org/viaf/14 http://viaf.org/viaf/14	180150288 18015028 14064895	http://citeres.univ-tours.fr/l http://citeres.univ-tours.fr/l http://archeologie.cg37.fr/li	at at ndex_archeologie.php	Tours Tours Chinon	https://sws.geo https://sws.geo https://sws.geo	names.org/2972 names.org/2972 names.org/3025	191/ Fouille programmée 191/ Fouille programmée 132/ Fouille préventive	2000	2003 2020 2004	2000- 2003 2004- 2020 juin 2000 septemil 2004
AJ ZX ZY	17	Mérimé Tours_site 17 - Marmoutier Chinon_Fort-St- George Chinon_Collégiale_St- Mexme	Henri Galinié Elisabeth Lorans Bruno Dufay Elisabeth Lorans	https://halshs.archives ouvertes.fr/search/inde https://halshs.archives ouvertes.fr/search/inde https://halshs.archives ouvertes.fr/search/inde https://halshs.archives ouvertes.fr/search/inde	Laboratoire - Archéologie et (CNRS/Unive Laboratoire - Archéologie et (CNRS/Unive - CNRS/Unive - SADIL - SADIL - SADIL - SADIL - SADIL - SADIL - CNRS/Unive - SADIL - CNRS/Unive - SADIL - CNRS/Unive - CNRS/Unive - CNRS/Unive - CNRS/Unive	http://viaf.org/viaf/14 http://viaf.org/viaf/14 http://viaf.org/viaf/14 http://viaf.org/viaf/14	180150288 18015028 14064895 18015028	http://citeres.univ-tours.fr/l http://citeres.univ-tours.fr/l http://archeologie.cg37.fr/i http://citeres.univ-tours.fr/l	at at ndex_archeologie.php at	Tours Tours Chinon Chinon	https://sws.geo https://sws.geo https://sws.geo	names.org/2972 names.org/2972 names.org/3025 names.org/3025	 191/ Fouille programmée 191/ Fouille programmée 132/ Fouille préventive 132/ Fouille programmée 	2000 2004 2004 , 1986	2003 2020 2004 1993	2000- 2003 2004- 2020 juin 200 septemi 2004 1986- 1993



Edit Triples M Mapping ID: Target (Triples arsol:isite{Sit skos:prefLa {datefin} ^M xs	Map Datation découverte Template): le}#Decouverte a sci le}#Decouverte-Data bel {datelitt} ^M xsd:st d:dateTime .	e tion a ring ;	_Enco a crm: crm:f	punter_Event ; E52_Time-Span P82a_begin_of_	crm:P4_h ; crm:P4 the_beg	as_time-span arsol: i_is_time-span_of s in {datedebut} xsd:	isite{Site}#I sci:S19_Enc :dateTime ;	Decouverte-Datation . sounter_Event ; crm:P82b_end_of_t	X	 SQ car dat 	L quo n be ta be	eries and used to cl fore trans	func ean sforr	ctio up nin	ns th g i	e t.
Source (SQL C SELECT Site, sites WHERE	Query): , datelitt, CONCAT(da : datelitt <> '' AND da	atede	:b, '-01 c <> ''/	I-01⊤00:00:00') ; AND datefin <> "	as datede	but, CONCAT(datefin	ı, '-12-31T2	3:59:59') <mark>as</mark> datefin F	ROM	 In t pro for cor xsd CO 	this o wide mat, mply l:dat NCA	case, the c ed only in but we n to xsd:da eTime. Th T() functic	late the eed te o e on w	s ai YYN to r	re /Y	
														0.0		
SQL Query res	ults:									use	ea to	resolve ti	nis.			
	Site	in in d	074	datelitt	407	datedebut	40	datefin								
AA		2000-	974-00 2003	L 1978	2000	4-01-01100.00.00 0-01-01T00:00:00	20	78-12-31123.59.59 03-12-31T23:59:59								
AJ		2004-	2020		2004	4-01-01T00:00:00	20	20-12-31T23:59:59								
ZX		juin 2	004-se	ptembre 2004	2004	4-01-01T00:00:00	20	04-12-31T23:59:59								
ZY		1986-	1993		1986	6-01-01T00:00:00	19	93-12-31T23:59:59								
ZZ		1986-	1999		1986	6-01-01T00:00:00	19	99-12-31T23:59:59								
		Site	Num	Nom	Responsable	e HAL	Institution	viaf_institution	Web		localisation	geoname	operation	datedeb	datefin	datelitt
		AA	3	Tours_site 3 - Château de Tours	Henri Galinié	https://halshs.archives- ouvertes.fr/search/index/q	Archéologie et Territoires (CNRS/Unive	http://viaf.org/viaf/148015028	http://citeres.univ-to	urs.fr/lat	Tours	https://sws.geonames.org/2972191/	/ Fouille programmée	1974	1978	juin 1974- oct. 1978
Execute t	the SQL query (100 ro	AI	16	Tours_site 16 - Saint- Julien square Prosper Mérimé	Henri Galinié	https://halshs.archives- ouvertes.fr/search/index/q.	Laboratoire Archéologie et Territoires (CNRS/Unive	http://viaf.org/viaf/1480150288	http://citeres.univ-to	urs.fr/lat	Tours	https://sws.geonames.org/2972191/	/ Fouille programmée	2000	2003	2000- 2003
		AJ	17	Tours_site 17 - Marmoutier	Elisabeth Lorans	https://halshs.archives- ouvertes.fr/search/index/q	Laboratoire Archéologie et Territoires (CNRS/Unive	http://viaf.org/viaf/148015028	http://citeres.univ-to	urs.fr/lat	Tours	https://sws.geonames.org/2972191/	/ Fouille programmée	2004	2020	2004- 2020
		zx		Chinon_Fort-St- George	Bruno Dufaÿ	https://halshs.archives- ouvertes.fr/search/index/q.	SADIL - Département 37	http://viaf.org/viaf/144064895	http://archeologie.cg	37.fr/index_archeologie.pt	np Chinon	https://sws.geonames.org/3025132/	/ Fouille préventive	2004	2004	juin 2004- septembre 2004
		ZY		Chinon_Collégiale_St- Mexme	Elisabeth Lorans	https://halshs.archives- ouvertes.fr/search/index/q	Laboratoire Archéologie et Territoires (CNRS/Unive	http://viaf.org/viaf/148015028	http://citeres.univ-to	urs.fr/lat	Chinon	https://sws.geonames.org/3025132/	/ Fouille programmée	1986	1993	1986- 1993
		ZZ		Rigny-Ussé_Rigny 1	Elisabeth Zadora-Rio	https://halshs.archives- ouvertes.fr/search/index/q.	Laboratoire Archéologie et Territoires	http://viaf.org/viaf/148015028	http://citeres.univ-to	urs.fr/lat	Rigny-Ussé	https://sws.geonames.org/2983546	/ Fouille programmée	1986	1999	1986- 1999



14

Edit Triples Map Mapping ID: Datation découvert Target (Triples Template): arsol:isite{Site}#Decouverte : sc arsol:isite{Site}#Decouverte-Dat skos:prefLabel {datelitt}**xsd:s {datefin}**xsd:dateTime .	te ci:S19_Encc ation a crm: string ; crm:I	bunter_Event ; E52_Time-Spar P82a_begin_of	crm:P4_h 1;crm:P4i the_begi	as_time-spar arsol: is_time-span_of s n {datedebut} [™] xsd:	× ne_end	Map data CIDO indu trea ress	oping set DC-C iced ted ourc	g a pre-ex means tha CRM entiti in the dat as a singu ce.	istin at so es a ta b lar	ig om ire ut		
Source (SQL Query): SELECT Site, datelitt, CONCAT(c sites WHERE datelitt <> " AND datelitt	Jatedeb, '-0' atedeb <> "/	1-01T00:00:00') AND datefin <> ''	as datedel	out, CONCAT(datefin	ı, '-12-31T2	3:59:59') as datefin Fl	ROM	Use prov thes back	of a vide se er	nchors is a URI for s ntities whi the resour	a mo som le li rce v	ea le nk wł
SQL Query results:								000	0			
Site		datelitt		datedebut		datefin		the	indu	iced data	is	
AA	juin 1974-oc	t. 1978	1974	-01-01T00:00:00	19	78-12-31T23:59:59		the				
AI	2000-2003		2000	-01-01100.00.00	20	20-12-31123.09.09 20-12-31T23:59:59		nuh	licha	2		
ZX	juin 2004-se	ptembre 2004	2004	-01-01T00:00:00	20	04-12-31T23:59:59		pup	112116	eu.		
ZY	1986-1993		1986	-01-01T00:00:00	19	93-12-31T23:59:59		•				
22	1986-1999		1986	-01-01T00:00:00	19	99-12-31T23:59:59						
	Site Num	Nom	Responsable	HAL	Institution	viaf_institution	Web		localisation	geoname	operation	dated
	AA 3	Tours_site 3 - Château de Tours	Henr <mark>i</mark> Galinié	https://halshs.archives- ouvertes.fr/search/index/q	Archéologie et Territoires (CNRS/Unive	http://viaf.org/viaf/148015028	http://citeres.univ-tours.	fr/lat	Tours	https://sws.geonames.org/2972191	Fouille programmée	1974
Execute the SQL query (100	AI 16	Tours_site 16 - Saint- Julien square Prosper Mérimé	Henri Galinié	https://halshs.archives- ouvertes.fr/search/index/q.	Laboratoire Archéologie et Territoires (CNRS/Unive	http://viaf.org/viaf/1480150288	http://citeres.univ-tours.	fr/lat	Tours	https://sws.geonames.org/2972191	/ Fouille programmée	2000
	— AJ 17	Tours_site 17 - Marmoutier	Elisabeth Lorans	https://halshs.archives- ouvertes.fr/search/index/q	Laboratoire Archéologie et Territoires (CNRS/Unive	http://viaf.org/viaf/148015028	http://citeres.univ-tours.	fr/lat	Tours	https://sws.geonames.org/2972191	/ Fouille programmée	2004
	ZX	Chinon_Fort-St- George	Bruno Dufaÿ	https://halshs.archives- ouvertes.fr/search/index/q.	SADIL - Département 37	http://viaf.org/viaf/144064895	http://archeologie.cg37.	fr/index_archeologie.ph	p Chinon	https://sws.geonames.org/3025132	Pouille préventive	2004
	ZY	Chinon_Collégiale_St- Mexme	Elisabeth Lorans	https://halshs.archives- ouvertes.fr/search/index/q	Archéologie et Territoires (CNRS/Unive	http://viaf.org/viaf/148015028	http://citeres.univ-tours.	fr/lat	Chinon	https://sws.geonames.org/3025132	Fouille programmée	986
	ZZ	Rigny-Ussé_Rigny 1	Elisabeth Zadora-Rio	https://halshs.archives- ouvertes.fr/search/index/q.	Laboratoire Archéologie et Territoires (CNRS/Unive	http://viaf.org/viaf/148015028	http://citeres.univ-tours.	fr/lat	Rigny-Ussé	https://sws.geonames.org/2983546	5/ Fouille programmée	1986

- re-existing ns that some entities are e data but not singular
- ors is a mean to I for some of s while linking esource where data is

operation datedeb datefin datelitt

1978

2020

2004

juin 1974-oct. 1978

2000-2003 2003

2004-2020

juin 2004-septembre

2004

1986-1993 1993

1986-1999 1999



Results

	<pre>0 ### http://arsol.univ-tours.fr/4DACTION/WFICHEWEB/ifaitAA000003</pre>	
	<pre>1 <http: 4daction="" arsol.univ-tours.fr="" ifaitaa000003="" wficheweb=""> rdf:</http:></pre>	:ype <http: cidoc-crm="" e25_man-made_feature="" www.cidoc-crm.org=""> ;</http:>
	2 Khtt)://www.cidoc-crm.org/cidoc-crm/P2_has_type> <https: 26678="" ark.frantiq.fr="" ark:="" crtyueo4s4gyd=""> ;</https:>
	3 <htt< b=""></htt<>	p://www.cidoc-crm.org/cidoc-crm/P3_has_note> "tranchée de construction de M3" ;
	4 <htt< td=""><td>://www.cidoc-crm.org/cidoc-crm/P46_is_composed_of> <http: 4daction="" arsol.univ-tours.fr="" iususaa002001="" wficheweb=""> ,</http:></td></htt<>	://www.cidoc-crm.org/cidoc-crm/P46_is_composed_of> <http: 4daction="" arsol.univ-tours.fr="" iususaa002001="" wficheweb=""> ,</http:>
		<pre><http: 4daction="" arsol.univ-tours.fr="" iususaa002099="" wficheweb=""> ,</http:></pre>
		<pre><http: 4daction="" arsol.univ-tours.fr="" iususaa002100="" wficheweb=""> ;</http:></pre>
	7 Khtt	://www.cidoc-crm.org/cidoc-crm/P48 has preferred identifier> <http: 4daction="" arsol.univ-tours.fr="" ifaitaa000003#identifiant="" wficheweb=""> :</http:>
	8 (htt	://www.ics.forth.gr/is1/CRMsci/019i was object found bv> <http: 4daction="" arsol.univ-tours.fr="" isiteaa#decouverte="" wficheweb=""> :</http:>
	9 chtt	://www.w3.org/2004/02/kos/core#pref.abel> "tranchée de construction (AA000003)"
	A	
	 2 ### http://apsol upiv_tours fr/4DACTION/WEICHEWER/ifsitAA000005	
242	<pre>//arsol.univ-cours.in/*DACTION/WFICHEWED/InalCAROBODOS // //arsol.univ-cours.in/*DACTION/WFICHEWED/InalCAROBODOS // //arsol.univ-cours.in/*DACTION//WFICHEWED/INALCAROBODOS // //arsol.univ-cours.in/*DACTION/WFICHEWED/INALCAROBODOS // //arsol.univ-cours.in/*DACTION/#</pre>	una (http://www.aidas.aum_ang/aidas.aum/EDE Man Mada Eastura) .
	S Child Sol and Cours Tr/40AciioN/Wricheweb/Ital(AA000005) rut.	ype (http://www.clude-crm.org/clude-crm/c25_man-made_reaure/ ; . //www.clude-crm.org/clude-crm/c55_man-made_reaure/ ;
);//www.clube-crm.brg/clube-crm/r2_nas_type/ (https://ark.trantid.tr/ark:/20078/crtyuE0+34090) ;
		;//www.clude-crm.org/clude-crm/F5_nsta_note/ trou de poteau ;
		://www.cldoc-crm.org/cldoc-crm/P48_nas_preterred_ldentitler> <nttp: 4daciion="" arsol.univ-tours.tr="" iratha000005#identitlant="" wilchewep=""> ;</nttp:>
	۱۶ <ntt< td=""><td>://www.lcs.tortn.gr/ls1/CRMsc1/0191_was_object_tound_by> <nttp: 4daction="" arsol.univ-tours.tr="" isiteaa#decouverte="" wficheweb=""> ;</nttp:></td></ntt<>	://www.lcs.tortn.gr/ls1/CRMsc1/0191_was_object_tound_by> <nttp: 4daction="" arsol.univ-tours.tr="" isiteaa#decouverte="" wficheweb=""> ;</nttp:>
	9 (http://www.second.com/action/actio	://www.w3.org/2004/02/skos/core#prefLabel> "trou de poteau (AA000005)" .
	2 ### http://arsol.univ-tours.fr/4DACTION/WFICHEWEB/ifaitAA000006	
	3 <http: 4daction="" arsol.univ-tours.fr="" ifaitaa000006="" wficheweb=""> rdf:</http:>	:ype <http: cidoc-crm="" e25_man-made_feature="" www.cidoc-crm.org=""> ;</http:>
254	4 <http: actio<="" action="" td="" www.second.com=""><td>)://www.cidoc-crm.org/cidoc-crm/P2_has_type> <https: 26678="" ark.frantiq.fr="" ark:="" crtyueo4s4gyd=""> ;</https:></td></http:>)://www.cidoc-crm.org/cidoc-crm/P2_has_type> <https: 26678="" ark.frantiq.fr="" ark:="" crtyueo4s4gyd=""> ;</https:>
	5 <http: stat<="" statescolution="" td="" www.statescolution.com=""><td>p://www.cidoc-crm.org/cidoc-crm/P3_has_note> "trou" ;</td></http:>	p://www.cidoc-crm.org/cidoc-crm/P3_has_note> "trou" ;
	6 <http: <="" td="" www.chttp:=""><td>)://www.cidoc-crm.org/cidoc-crm/P46_is_composed_of> <http: 4daction="" arsol.univ-tours.fr="" iususaa003006="" wficheweb=""> ,</http:></td></http:>)://www.cidoc-crm.org/cidoc-crm/P46_is_composed_of> <http: 4daction="" arsol.univ-tours.fr="" iususaa003006="" wficheweb=""> ,</http:>
		<http: 4daction="" arsol.univ-tours.fr="" iususaa003007="" wficheweb=""> ,</http:>
		<pre><http: 4daction="" arsol.univ-tours.fr="" iususaa003008="" wficheweb=""> ,</http:></pre>
		<pre><http: 4daction="" arsol.univ-tours.fr="" iususaa003009="" wficheweb=""> ,</http:></pre>
		http://arsol.univ-tours.fr/4DACTION/WFICHEWEB/iususAA003014 >
		http://arsol.univ-tours.fr/4DACTION/WFICHEWEB/iususAA003027 >
		<pre><http: 4daction="" arsol.univ-tours.fr="" iususaa003029="" wficheweb=""> ,</http:></pre>
		<pre><http: 4daction="" arsol.univ-tours.fr="" iususaa003031="" wficheweb=""> ,</http:></pre>
		<pre><http: 4daction="" arsol.univ-tours.fr="" iususaa003032="" wficheweb=""> .</http:></pre>
		http://arsol.univ-tours.fr/4DACTION/WFICHEWEB/iususAA003033>
		<pre><http: 4daction="" arsol.univ-tours.fr="" iususaa003034="" wficheweb=""> .</http:></pre>
		http://arsol.univ-tours.fr/4DACTION/WFICHEWEB/iususAA003035>
		http://arsol.univ-tours.fr/4DACTION/WFICHEWEB/iususAA003037>
		http://arsol.univ-tours.fr/4DACTION/WFICHEWEB/iususAA003038
278		http://arsol.univ-tours.fr/4DACTION/WFICHEWEB/jususAA003040
		<pre><http: 4daction="" arsol.univ-tours.fr="" iususaaa033442="" wficheweb=""></http:></pre>
		<pre>chttp://arsol.univ-tours.fr/4DACTION/WFICHEWEB/jususAA003043></pre>
		<pre><http: 4daction="" arsol.univ-tours.fr="" jususaa003046="" wficheweb=""></http:></pre>
		(http://arsol.univ-tours.fr/4DaCTION/WFICHWEF/iuusAAAA3A475
		(http://arsol.univ-tours.fr/ADACTION/UFTCHEUR/ADAGGOV/)
		(http://arsol univ-tours.fr/dDACTION/WEIGHEWE/isusAd003057)
		(http://arealusiv.tours.fr/40Acitory/tursusAa0330612),
	2 Att	v//www.cidoc.com.org/cidoc.com/D48 has proferred identifiers.chtmv//assal.univ-tours in/40xcitom/writcheets/assaAd0305/5;
		//www.tiddt.crm.org/tiddt.crm/reginas_preteried_tdentifier/structures.init*tours.init*tours.in/watcheweb/italtAadoodoodsidentifiant>;
		<pre>>.//www.ics.ford.gr/is/chast/cuti_was_doject_found_dy <ntcp: 4dacliok="" arsol.univ-tours.fr="" isiteaa#decouverte="" wricheweb=""> ; >.//www.ics.ford.gr/is/chast/cuti_was_doject_found_dy <ntcp: 4dacliok="" arsol.univ-tours.fr="" isiteaa#decouverte="" wricheweb=""> ; >.//www.ics.ford.gr/isiteAa#Decouverte> ;</ntcp:></ntcp:></pre>
200		
201		
2 lines, 1 cha	I character selected	

Valid Data is conformant !



Results

GraphDB	<			_					F openarchae	10 ~
	FREE	ar	sol.univ-tou	irs.fr 🥖	>					
Import	\sim	Sourc	ce: http://arsol.univ-tours.fr							
	^	su	bject predicate obje	ct context	all			Explicit only ~	Show Blank Nodes Download	d as \vee
Graphs overview				subject	\$	predicate 🗘	object	\$	context	\$
Class hierarchy		1	http://archeologie.cg37.fr/inc	ex_archeologie.p	bhp	rdf:type	crm:E42_Identifier		http://arsol.univ-tours.fr	
Class relationships		2	wficheweb:ifaitAA000001			rdf:type	crm:E25_Human-Made_Feature		http://arsol.univ-tours.fr	
Visual graph		3	wficheweb:ifaitAA000001			rdf:type	crm:E25_Man-Made_Feature		http://arsol.univ-tours.fr	
SPARQL		4	wficheweb:ifaitAA000003			rdf:type	crm:E25_Human-Made_Feature		http://arsol.univ-tours.fr	
		5	wficheweb:ifaitAA000003			rdf:type	crm:E25_Man-Made_Feature		http://arsol.univ-tours.fr	
Monitor	\sim	6	wficheweb:ifaitAA000005			rdf:type	crm:E25_Human-Made_Feature		http://arsol.univ-tours.fr	
Setup	~	7	wficheweb:ifaitAA000005			rdf:type	crm:E25_Man-Made_Feature		http://arsol.univ-tours.fr	
Serup	Ť	8	wficheweb:ifaitAA000006			rdf:type	crm:E25_Human-Made_Feature		http://arsol.univ-tours.fr	
Help	\sim	9	wficheweb:ifaitAA000006			rdf:type	crm:E25_Man-Made_Feature		http://arsol.univ-tours.fr	
-		10	wficheweb:ifaitAA000007			rdf:type	crm:E25_Human-Made_Feature		http://arsol.univ-tours.fr	
		11	wficheweb:ifaitAA000007			rdf:type	crm:E25_Man-Made_Feature		http://arsol.univ-tours.fr	
		12	wficheweb:ifaitAA000008			rdf:type	crm:E25_Human-Made_Feature		http://arsol.univ-tours.fr	
		13	wficheweb:ifaitAA000008			rdf:type	crm:E25_Man-Made_Feature		http://arsol.univ-tours.fr	
		14	wficheweb:ifaitAA000009			rdf:type	crm:E25_Human-Made_Feature		http://arsol.univ-tours.fr	
		15	wficheweb:ifaitAA000009			rdf:type	crm:E25_Man-Made_Feature		http://arsol.univ-tours.fr	
		16	wficheweb:ifaitAA000010			rdf:type	crm:E25_Human-Made_Feature		http://arsol.univ-tours.fr	
		17	wficheweb:ifaitAA000010			rdf:type	crm:E25_Man-Made_Feature		http://arsol.univ-tours.fr	
		18	wficheweb:ifaitAA000011			rdf:type	crm:E25_Human-Made_Feature		http://arsol.univ-tours.fr	
		19	wficheweb:ifaitAA000011			rdf:type	crm:E25_Man-Made_Feature		http://arsol.univ-tours.fr	
		20	wficheweb:ifaitAA000012			rdf:type	crm:E25_Human-Made_Feature		http://arsol.univ-tours.fr	

