

An architecture based on SOA, RESTful and Mashup for C2 mobile applications

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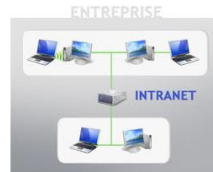
¹ITA, Brasil

17th ICCRTS “Operationalizing C2 Agility”

Web 2.0



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<http://www.selectweb.com.br/index.php/projetos-personalizados/>

Outline

1

Introduction

- Information Technology Structures

2

Problem Analysis

3

Basic Concepts

- SOA and Webservices
- Ontologies
- Mobile Agents in NCW and Mobile Computing
- Mashups
- Security

4

Proof-of-Concept Implementation

5

Our contribution

- Benefits
- Problems

6

Bibliography

- Systems are installed in each machine from network
- The Softwares migrated to web and are accessed via browser
- Web 2.0 and Cloud Computing

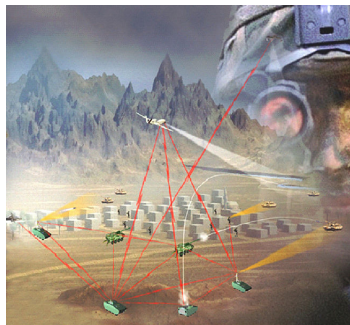


<http://www.blogtimicrocamp.com.br/wp-content/uploads/2012/05/Cloud-Computing-Companies11.jpg>

- In other countries such as Brazil, military area uses commercial Information technology to manage their systems
- In such situation is common to find multiple systems that manage portions of specific activities of an organization
- Current solutions work for systems that make access to different databases through segregated networks



- The big challenge is to provide resources that would not be available in the Internet
- Is need to share different information in an environment of Network Centric Warfare



<http://ericpalmer.wordpress.com/category/ncw/>

Systems MD

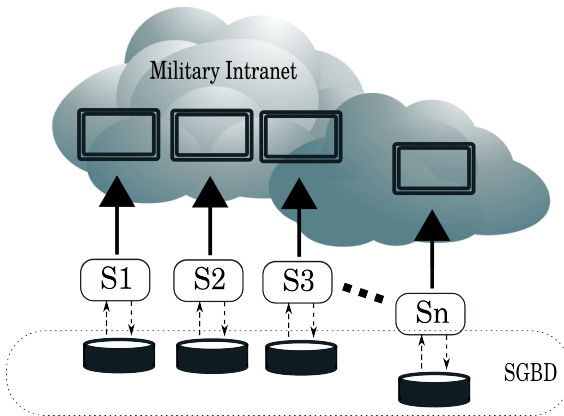
Sistema	Sist de C²	Órgão Central	Rede Adm	Sistema Op
Naval	SisNC2	CCTOM	IntraMar	Carta-SAGBD
Terrestre	SC2FTer	CC ² FTer	EBNet	C2 em Combate
Aéreo	CISCENDA	CCCOA	INTRAER	HÉRCULES
Espacial	SISDABRA	CONDABRA	-	DACOM
CmdoSupremo	SISMC2	CC2CS	DEFESA	SIPLOM

Cel J. Carlos S., 2006, O modelo de dados da OTAN, ECEME

Adoption Open Source

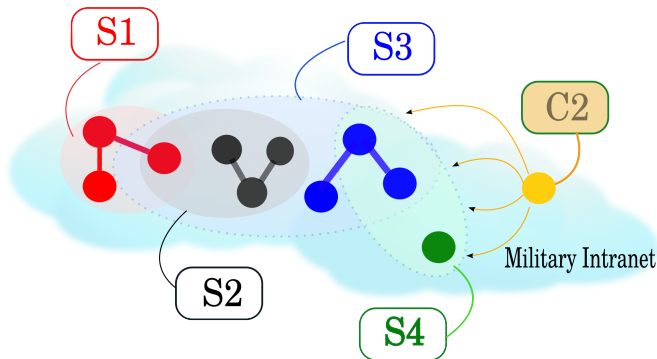
- The main problem to manage different systems is the interoperability among them
- Standardizing Open Source as a government policy
- Don't have an intuitive interface, documentation and supported by a specialized team

- The new languages and paradigms of software development with more features, increase the difficulty of systems interoperability



SOA and Webservices

- Portfolio provides a comprehensive range of capabilities for the entire services lifecycle
- This approach promotes integrated and reusable business processes or services
- applications should be provided as services



Concept of Web Services

- Also known as Webservices
- Created before the SOA
- The services offered are consumed by customers
- Service is the representation of Information Technology some business functionality
- WSDL uses XML-based description of services

two architectures more used

WS-*/SOAP:

- Several development tools.
- When used over HTTP, it is hardly blocked by firewalls and proxies.
- Proprietary platform and language independent.
- Complexity in patterns
- Messages are more extensive (Overhead)

Representational State Transfer

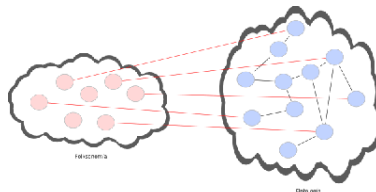
RESTful:

- Originated from a doctoral thesis in 2000
- It's all based on the architecture proposed REST
- Ease of adoption, does not require intermediate layer.
- Uses the web to transport data with High performance
- Not yet defined patterns
- It is not intended to travel large data volumes



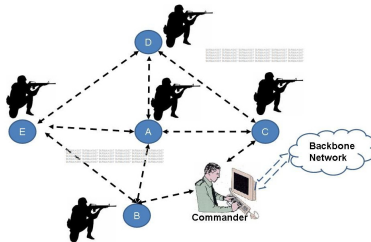
Concepts

- It is originated in the philosophy
- Represents knowledge and the relationships between the concepts
- Semantic heterogeneity
- Conflicts occur when two items of information appear to have the same spelling but differ in the real meaning
- It is necessary to the definition of an ontology on top all systems



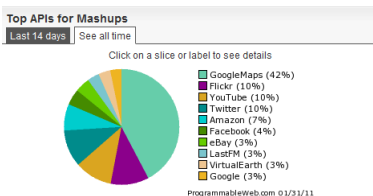
Military Concepts

- The agents have context modified all over the time because the scenario in Network Warfare is dynamic
- The connections are unstable
- The most important activity in agent's mission is to maintain the communication between them
- Devices are capable of storing a wide variety of data



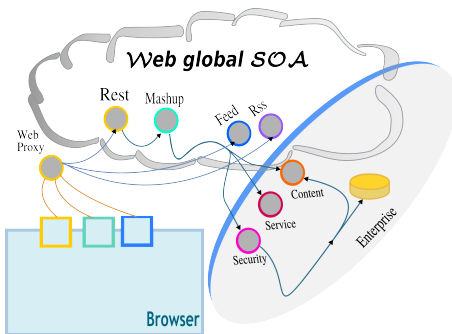
Concepts

- Combines services from different websites into a single website
- The creation of a service is made through two or more API from existing data
- Basically Mashups is a mix of various data sources, using RESTful
- Examples are Yahoo Pipes, Google Maps and Twitter

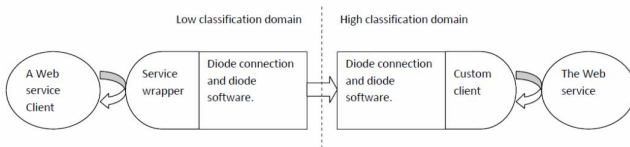


Mashups Concepts

- Are lighter and can provide services with low bandwidth in order to connect mobile customers
- Is the result of rapid development in small scale
- Provide immediate benefit at little cost



- Virtual Private Network is a private communications network usually used by a company or group of companies / institutions, built over a public communications network
- "Collective C2 in Multinational Civil-Military Operations" [Trude H. ICCRTS 2011]

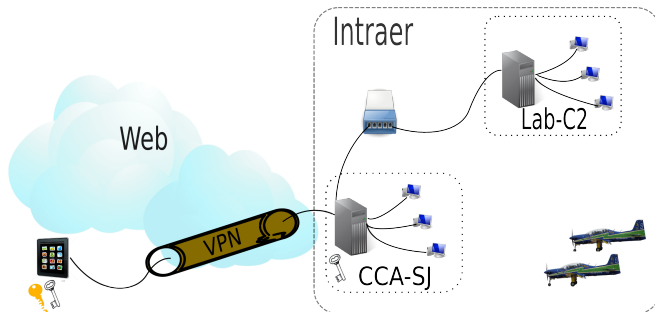


Technologies used

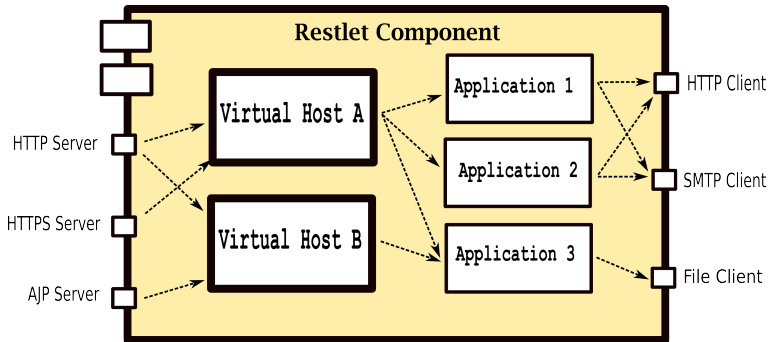
- Eclipse
- TomCat
- Protégé
- Restlet
- Joomla
- OpenVPN

Tests

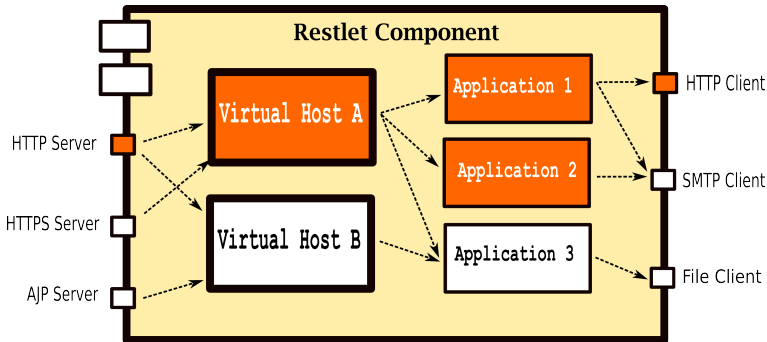
- Access services published on the Intranet via Internet
- Change and update data via HTTP using RESTful protocol

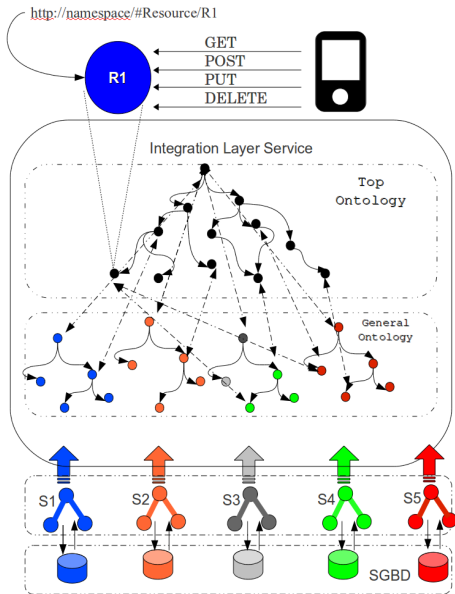


Restlet



Restlet





SIGADAER



SIGADAER
Sistema Informatizado de Gestão Arquivística
de Documentos do Aeronáutico

6ª Aux_SCE Enc_SIAI 2ª Aux_SIAI

Conheça as novidades do Sigadaer 4

 Vídeos Aulas
 Notas da versão

Ajuda
Legislação
Preferências
Sair do sistema

Menu

Documentos

Caixa de Entrada

Acompanhamentos

Redigir documento

Rascunhos

Outras Caixas

Caixa Personalizada

Marcadores

Pesquisa

Pesquisa Textual

Pendências OM

Administração

Caixa de Entrada - 8 documento(s)

Deseja registrar ciência automaticamente ao abrir os documentos?  

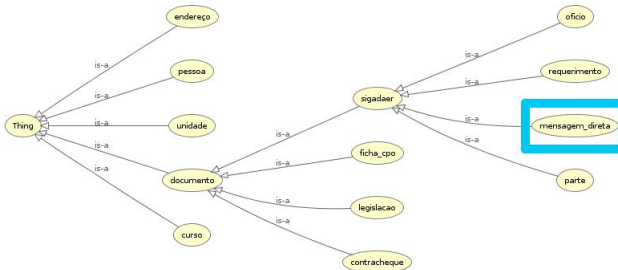
Legendas

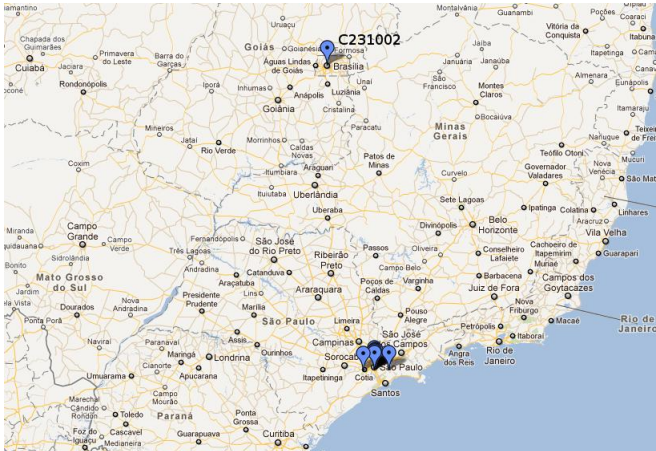
Colunas

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	Número	Tipo	OM de Origem	Assunto	Pendências	Autor	Elaboração	Prazo	Remetente	Data Envio
	AUTO/SIAI	Mensagem Fac-Símile	CCABR	Inscrição de	Aux da SIAI	1S Estefano (Enc da SIAI)	18/05/12 - 11:03		Enc da SIAI	18/05/12 - 11:37
	AUTO/SIAI	Mensagem Fac-Símile	CCABR		Aux da SIAI	1S Estefano (Enc da SIAI)	14/05/12 - 14:30		Enc da SIAI	14/05/12 - 14:32
	3/SIAI485	Ofício Simples	CCABR		Aux da SIAI	1S Estefano (Enc da SIAI)	21/03/12 - 11:51		Ch da SIAI	25/04/12 - 11:03
	8/SIAI	Parte	CCABR		Aux da SIAI	1S Estefano (Enc da SIAI)	07/11/11 - 10:58		Enc da SIAI	07/11/11 - 14:52
	auto/SIAI/auto	Mensagem Fac-Símile	CCABR		Aux da SIAI	3S V. Dias (Aux da SIAI)	01/03/11 - 17:38		Aux da SIAI	01/03/11 - 17:38
	0014/7EM	Mensagem Telegráfica	COMGEP		Aux da SIAI		06/12/10 - 09:29		Ch da SIAI	13/12/10 - 13:04
	0578/DCTP	Mensagem Fac-Símile	DECEA		Aux da SIAI		13/08/09 - 10:48	20/08/09 - 23:59	Ch da SIAI	20/08/09 - 10:52
	0041/DE3	Mensagem Telegráfica	VICENS		Aux da SIAI		18/03/09 - 16:28	27/03/09 - 23:59	Ch da SIAI	26/03/09 - 16:11

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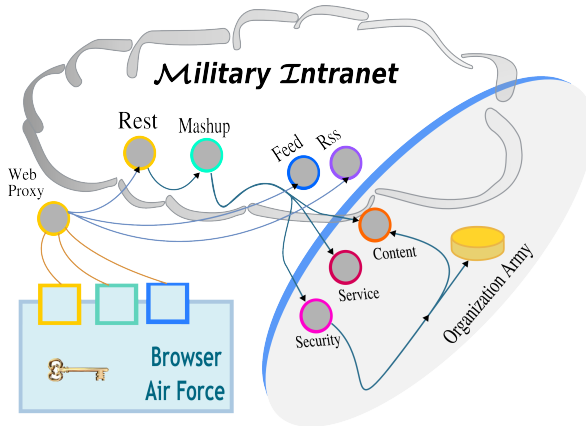


- Using mobile devices gain access to resources available via the services provided Intraer
- To analyze the performance and availability of the exchange data
- Greater autonomy of the nodes in an NCW



Benefits

- Standardization of services through publication of Ontologies
- Reuse systems and cost savings
- Simple and open protocol



Challenges

- Complex services
- Security



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Questions?



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THANK YOU!

