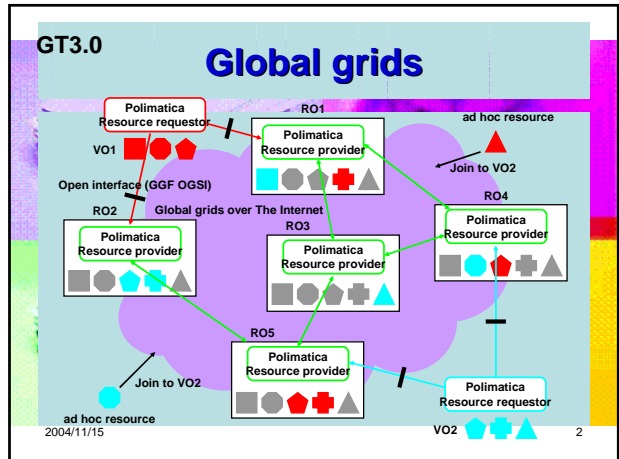


GT3.0

GT3による自律資源管理ミドルウェアPolimaticaの開発

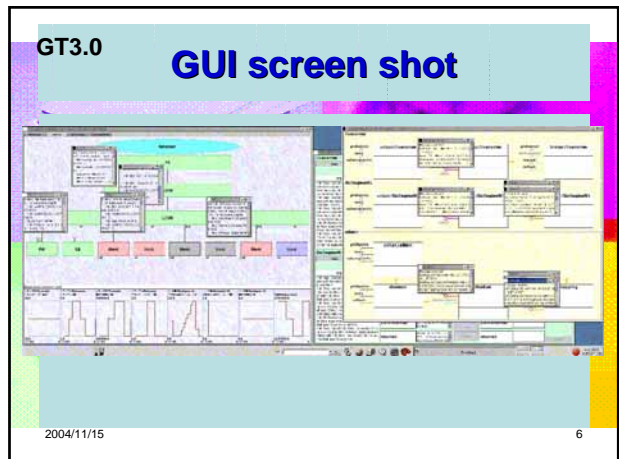
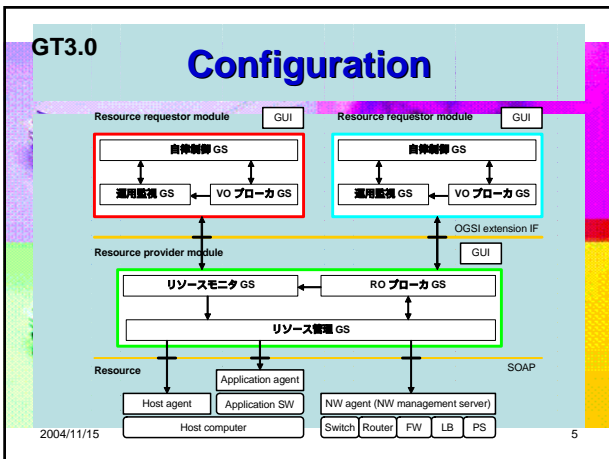
前野 義晴
NEC
y-maeno@aj.jp.nec.com

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- ## Objective
- **Polimatica: middleware to host a private VO for enterprise purposes**
 - **Customization of a private VO**
 - **Service BTO (built-to-order)**
 - Platform to build up a short-lived service
 - BTO over application software, host computers, network equipment supplied by *resource providers* on the Internet
 - **Policy-based customization**
 - Policy runtime for a *resource requestor* to customize the built up service
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- ## Characteristics
- **Software model**
 - Server-client (resource provider-requestor) overlay model
 - OGSi support
 - **Extensive resource data model**
 - Host computer attribute, application configuration, network equipment MIB
 - **Abstraction capability**
 - Resource view synthesis
 - Policy description (CONDITION/ACTION statements)
 - Operation aggregation (Into an ACTION)
 - **Implementation**
 - Globus toolkit 3.0.2
 - Globus MDS (monitoring and directory service) 2.4
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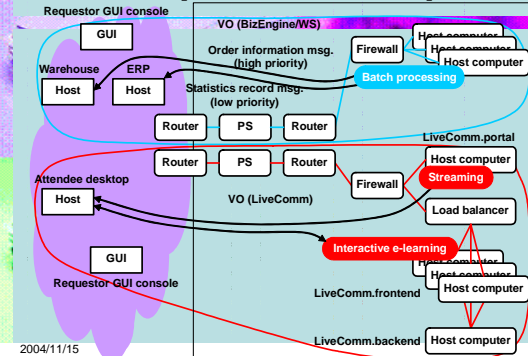
GT3.0 ASP laboratory test bed

- Private VO over ASP (resource provider)
- ASP application
 - NEC Livecomm (media streaming)
 - NEC ActiveGlobe BizEngine/WS (enterprise BtoB)
 - OpenPBS (job dispatcher)
- Resource requestor's VO customization
 - Adaptation of application settings
 - Network configuration (VLAN, ACL etc.)
 - Resource allocation

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GT3.0 Experiment setup



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GT3.0 Observation - action

	MDS Query	Action execution			Total TAT
		Total	SubmitRequest (OGSI based)	Callback (OGSI based)	
notifyState	3.4 sec	0.7 sec	0.03 sec	0.01 sec	4.1 sec
addNW	9.5 sec	1.3 sec	0.03 sec	0.01 sec	10.3 sec
removeNW	7.9 sec	1.4 sec	0.04 sec	0.01 sec	9.8 sec
addHost	5.9 sec	33.8 sec	0.14 sec	0.04 sec	39.7 sec
removeHost	8.0 sec	27.5 sec	0.15 sec	0.04 sec	35.5 sec

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GT3.0 Observation - agent

	Access latency	Throughput
Application agent	1.2 sec	2.5 kbyte/sec
Network equipment agent	2.1 sec	3.2 kbyte/sec
Host computer agent	0.59 sec	32.9 kbyte/sec

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GT3.0 Lessons

- The cycle time of the feedback loop can be 40 to 60 seconds.
 - This is because it takes 30 to 40 seconds to add a host computer to a private VO.
 - This is because the agent access latency is 10 times larger than the OGSI overhead.
- Access to the network equipment is the bottleneck.
- The OGSI overhead is irrelevant for resource management purposes.
- The number, sequence, and concurrency of agent access is relevant.

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GT3.0 Conclusion

- Polimatica supports service BTO and customizes a private VO
 - Demonstration of an ASP laboratory test bed
 - Media streaming
 - Enterprise BtoB
 - Job dispatcher
- Polimatica operates in the cycle time of 40 to 60 seconds.
 - The agent access latency is 10 times larger than the OGSI overhead.
 - Access to the network equipment is the bottleneck.

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GT3.0

Reference

- Yoshiharu Maeno et al., "Polimatica: Abstraction for Customizable Private Virtual Organizations in Global Grids," Proceedings of the IEEE International Conference on Web Services, pp.674-681, San Diego, July 2004.
- Takashi Kojo et al., "Polimatica: an Implementation of Policy Automated Provisioning Grid." NEC Journal of Advanced Technologies, pp.56-62, January 2004.

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