CORBA -
The Key To Vertical Harmony in the Telecom Domain

Yuval Levy
Chief Software Architect
Yuval-levy@vertel.Com
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The Statement Of Problem

To compete in today's markets carriers must provide fast and efficient services (cost effective),

➔ *Carriers must derive the most out of their modern network.*

➔ *To get the most out of the networks carriers must have a fully integrated network management (e.g. DSL provisioning).*

However:

➔ *The use of many different technologies, protocols, standards and models being deployed today creates a situation where deploying an integrated solution is complex, hard to accomplish, takes much too long, is too expensive, and is hard to maintain.*

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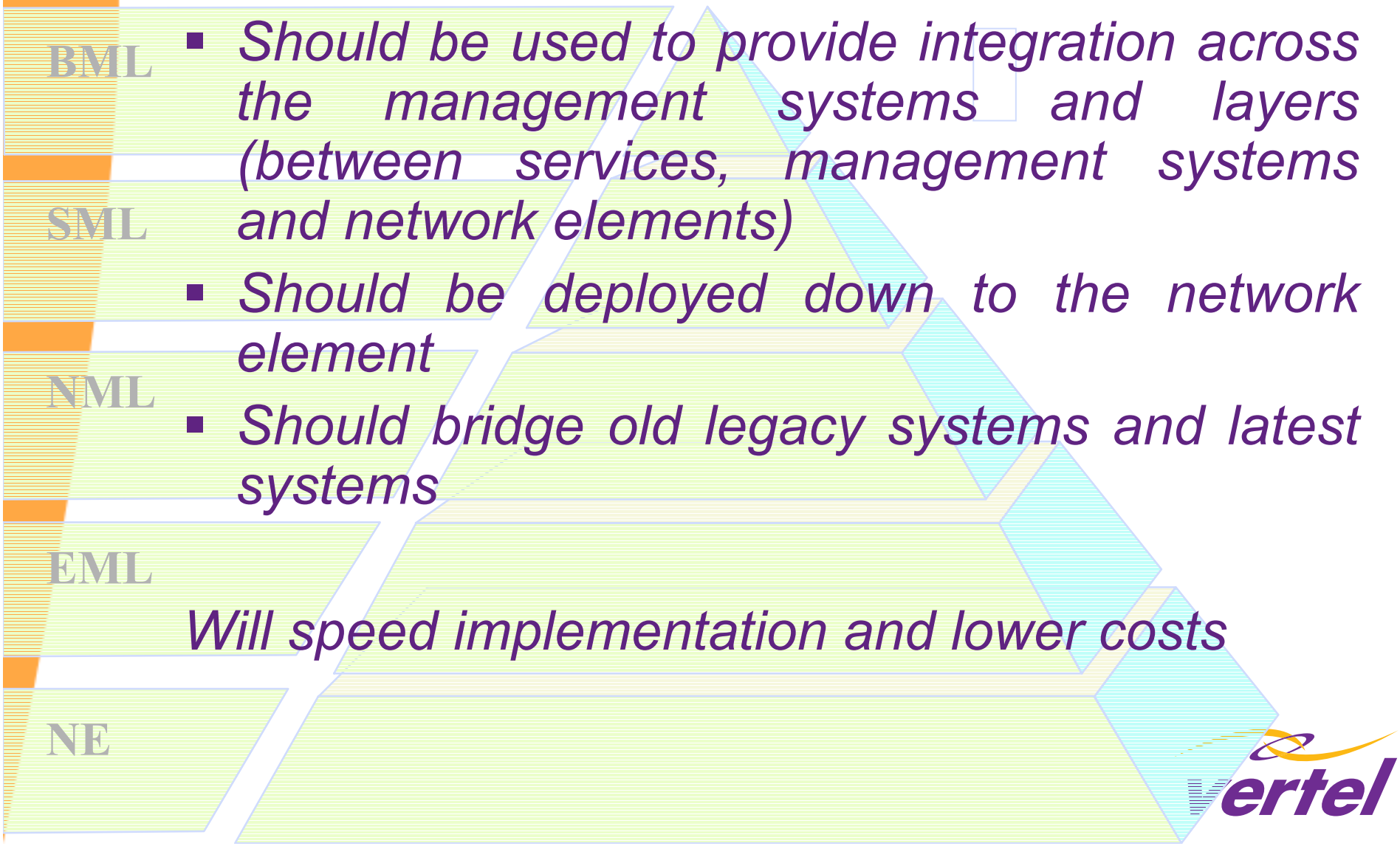
Suggested Solution - CORBA



- *Should be used to provide integration across the management systems and layers (between services, management systems and network elements)*
- *Should be deployed down to the network element*
- *Should bridge old legacy systems and latest systems*

Will speed implementation and lower costs

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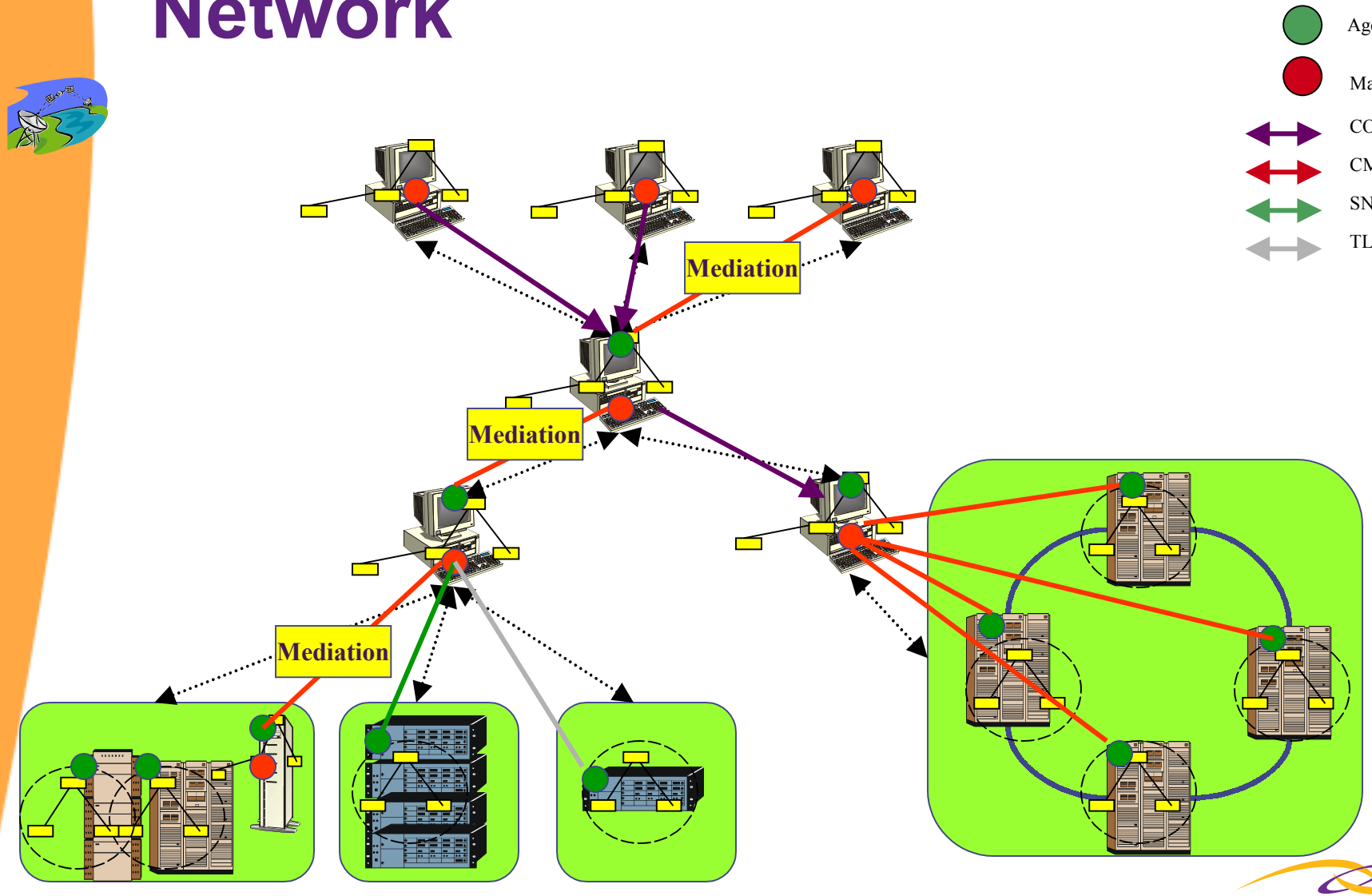
The Complexity of Today's Network



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Technologies Currently in Use (1)

CMIP/OSI

- *Excellent technical solution, for a perfect world, widely in use in Asia*
- *Fully OO, designed for solving the telecommunication market domain problems, however…*
- *Complex, not intuitive to many engineers*
- *Expensive in infrastructure (tools), highly paid engineers*
- *Small market share (after 10 years) only in the lower layers of the TMN hierarchy*

SNMP

- *Cheap- development tools, deployment, short educational curve for newcomers, large engineering base (compared with CMIP),*
- *Widely deployed - all Datacom devices include an SNMP agent*
- *Auto discovery*
- *Simple, easy and fast project initiation*
- *Can't scale to support big and complex network elements (for Sonet/SDH, DWDM, ATM, optical switches…)*
- *Hard to model non trivial equipment*
- *Unreliable transport and notifications*

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Technologies Currently in Use (2)

TL1 / ASCII

- *Easy to compose and interpret*
- *As fast as any pipe of ASCII messages can be*
- *Simple to understand*
- *Can be used with any language*
- *No model*
- *TL/1 is owned by Telcordia*
- *No standard MIB*
- *No compilation and run type checking - think maintenance and debug...*

Proprietary

- *….*

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Results

- *In infrastructure*
  - *Too many technologies (protocols, transports)*
  - *Some technologies are limited in scalability and robustness and impose "dirty or work around" solutions*
  - *Hard to integrate with legacy systems*
  - *Hard to integrate and use new SW technologies (such as java & application servers)*
- *In project life cycle & costs*
  - *Integration projects became a bottleneck for deployment of integrated solutions. Systems are ready but can't communicate*
  - *Hard to find experienced engineers to handle the integration of the different technologies and MIBs*
  - *Maintenance is hard and expensive (1 or 2 versions per system a year)*

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CORBA As Solution

- In infrastructure
  - Solution based on one technology
  - Can be applied to simple problems and scale to provide solution for the most complex problems and scenarios.
  - Can be used across different platforms, and multiple OSs, SW languages, and environments, SW methodologies and concepts and integrate legacy systems as well as the latest java based application servers
- In project life cycle & costs
  - Intuitive, fast and easy learning curve for C++ or java developers.
  - Main stream SW technology, used in all domains by many engineers (larger developers pool than any other protocol).
  - Maintenance problems is simplified.

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CORBA in the Enterprise Level

- Support from standards bodies to define interfaces using IDL (E.G. ITU-T, TMF, T1M1, ATM forum)
- 5 years of experience with the use of CORBA in telecom (Visibroker 4.0, Orbix 2000, e*orb)
- CORBA is widely used for
  - Inter-system communication &
  - Intra-system communication
- Improved standard (CORBA 2.3 & 3.0)
- Is used to provide and open access to legacy systems

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CORBA at the Network Element

Is it real?

YES!

- In-chassis command & control over the back-plane.
- Intelligent agent to upper management systems.

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CORBA at the Network Element (Cont.)

- New CORBA products tailored for embedded and real-time environment are fast (about 75% of the socket speed) and small (85K on PalmOS or 150K on VxWorks).
- CORBA brings advanced enterprise software concepts to the embedded network element.
- Enables mix and match of CPUs, OSs, SW languages (C++ & java), transports,
- Very flexible and open architecture enables customization to any given customer requirements.

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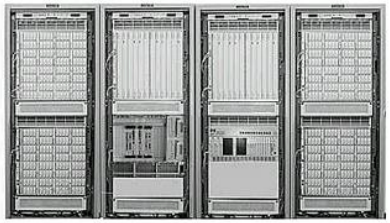
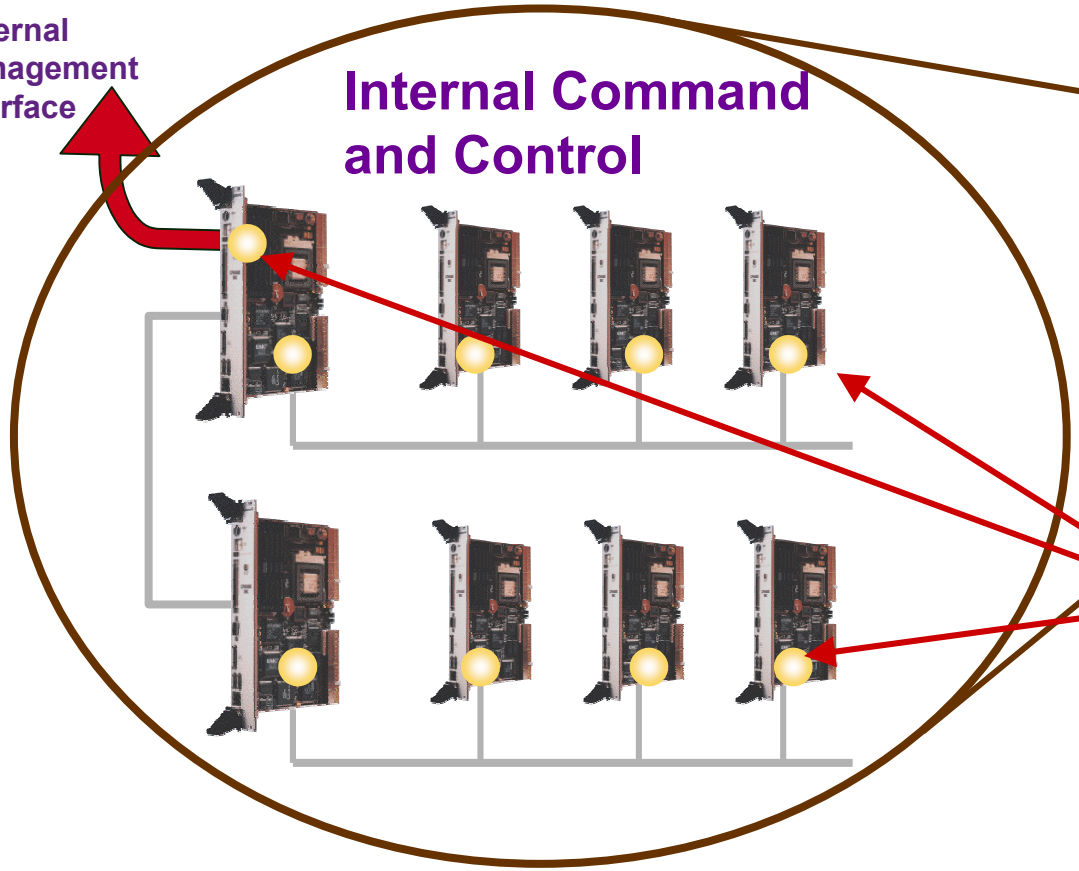
Example: *Telluim's Aurora Optical Switch*



External Management Interface

Internal Command and Control



ORB

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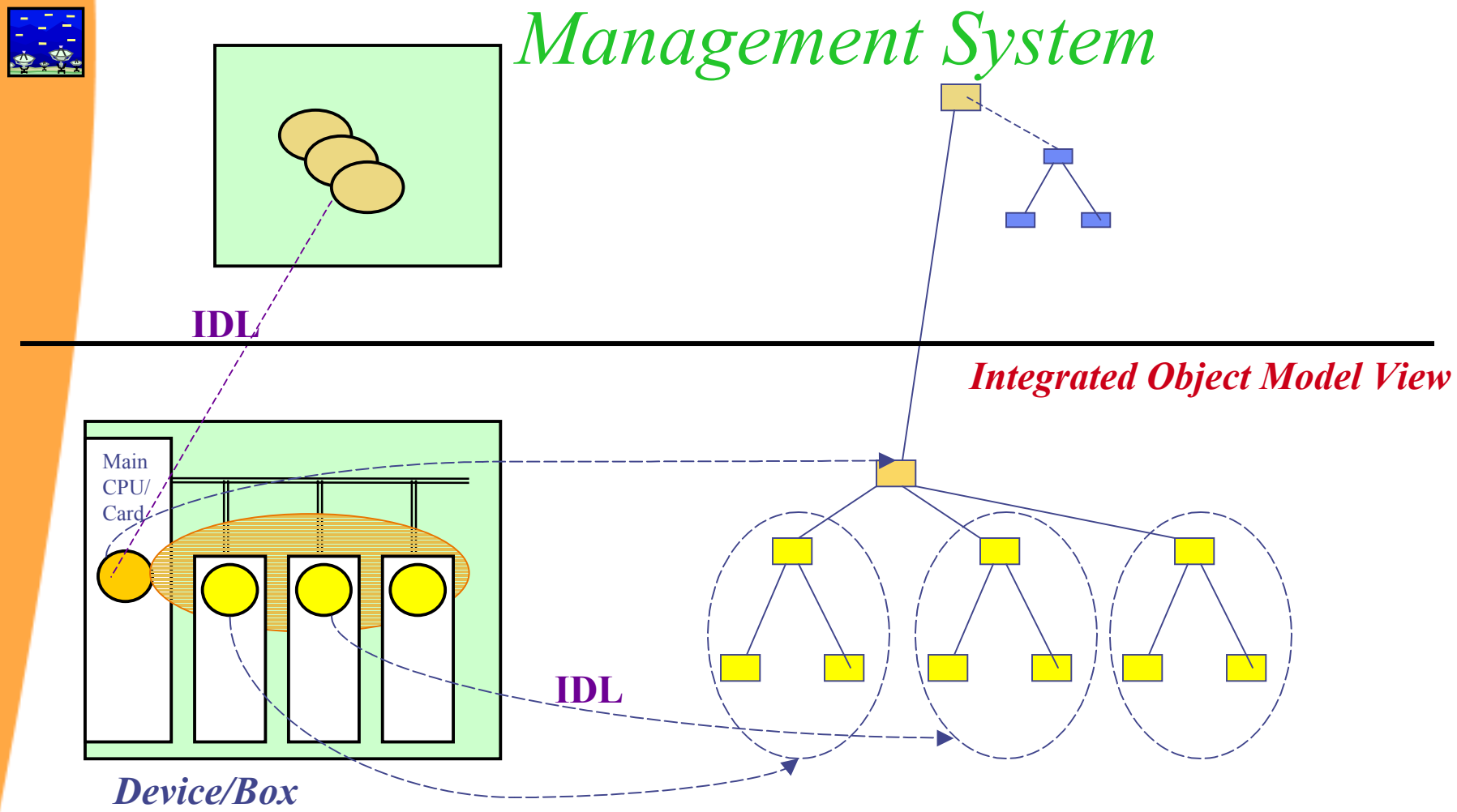
Integrated Object Model



What About Other Technologies?

- ***XML?***
- ***Soap?***
- ***Com+?***
- ***RMI?***

- Microsoft discounted the value and the future of **COM+** with the introduction of **SOAP and .Net** technology
- **RMI** uses IIOP as its transport and thus should be considered part of the overall CORBA technology picture.
- **SOAP** is basically a
  - Pipe for passing any given request that is represented in an XML/ASCII string.
  - Does not have a reference model
  - Like XML, works mainly for simple problems
  - Not scalable for the more wide and complex telecom domain problems.

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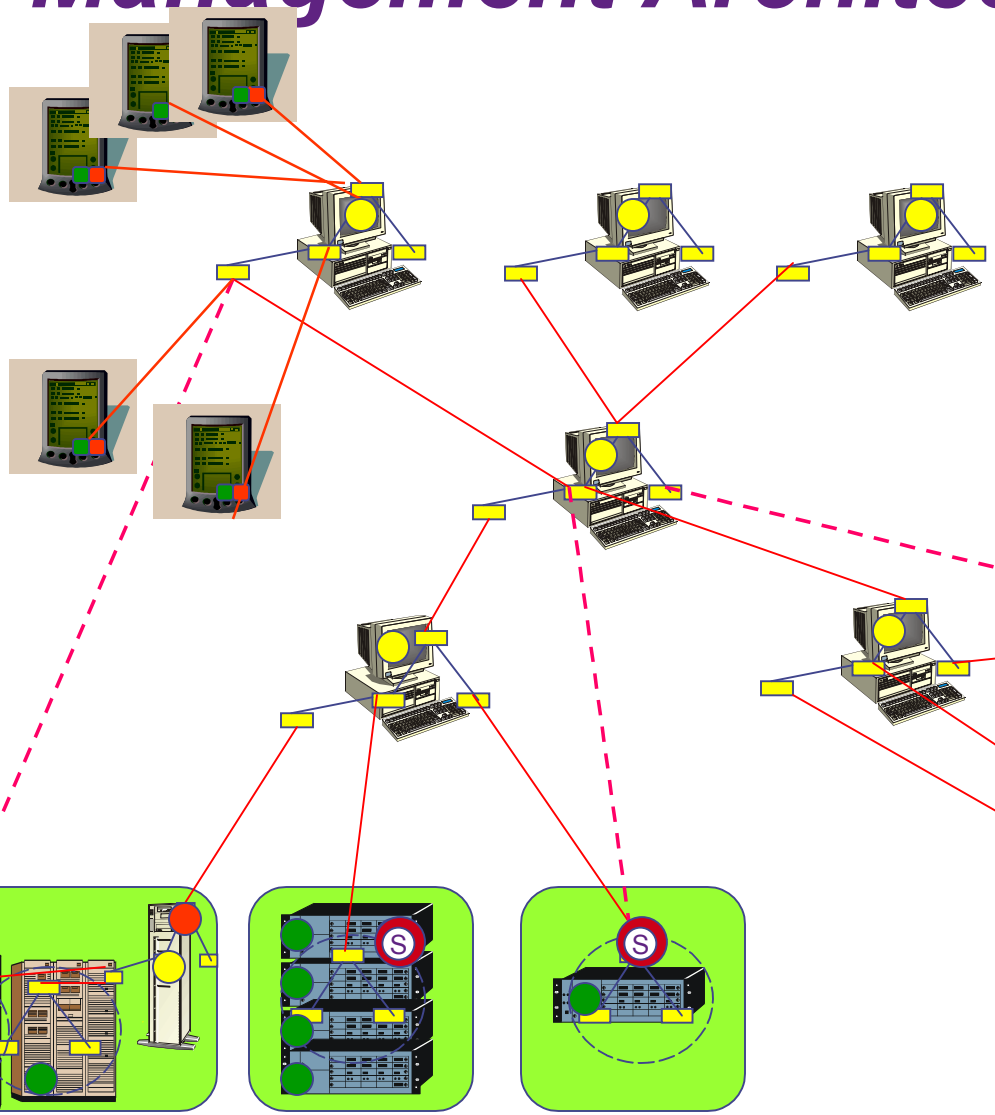
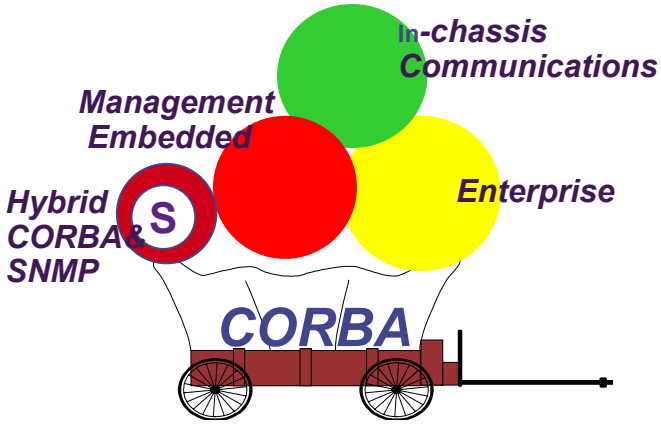
A Future View of the Network Management Architecture





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Summary

CORBA “can do the trick…”

Using CORBA for management interfaces from the network element up to the business services carrier will be able to deploy services faster and cheaper than they can do today.

Next project – ask yourself if CORBA is the best approach to grantee the project success

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Additional Examples & References

- T1M1- CORBA generic network and NE level information model:

ftp://ftp.t1.org/pub/t1m1/m1.5/2000/0m150300.doc

- Telemenagment forum – CORBA interfaces for work on EMS to NMS under the connection management activities, `e.G TMF807 CaSMIM solution set (in CORBA IDL)`

Http\\:www.tmforum.Org

- Vertel - case study:

http://www.vertel.com/news_events/casestudies/tellium.asp or

http://www.vertel.com/news_events/casestudies/tellium.asp

- AT&T laboratories Cambridge –

http://www.cam-orl.co.uk/corba.html

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Thank You

For more details mailto:Yuval-Levy@vertel.com