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DDS Scalability: “One size fits all ??.. ”

For OMG RTE-workshop, July 2007

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Agenda

INTO THE MOOD	*"… A paradigm shift …"*
CRITICAL INFRASTRUCTURES	*"… The Data is the Network © …"*
A MODEL	*"… For DDS applicability …"*
DDS APPLICABILITY	*"… One size fits all ?? ..."*
DDS USECASE	*"… Work in Progress ..."*
CONCLUSION	*"… Wait & See ..."*

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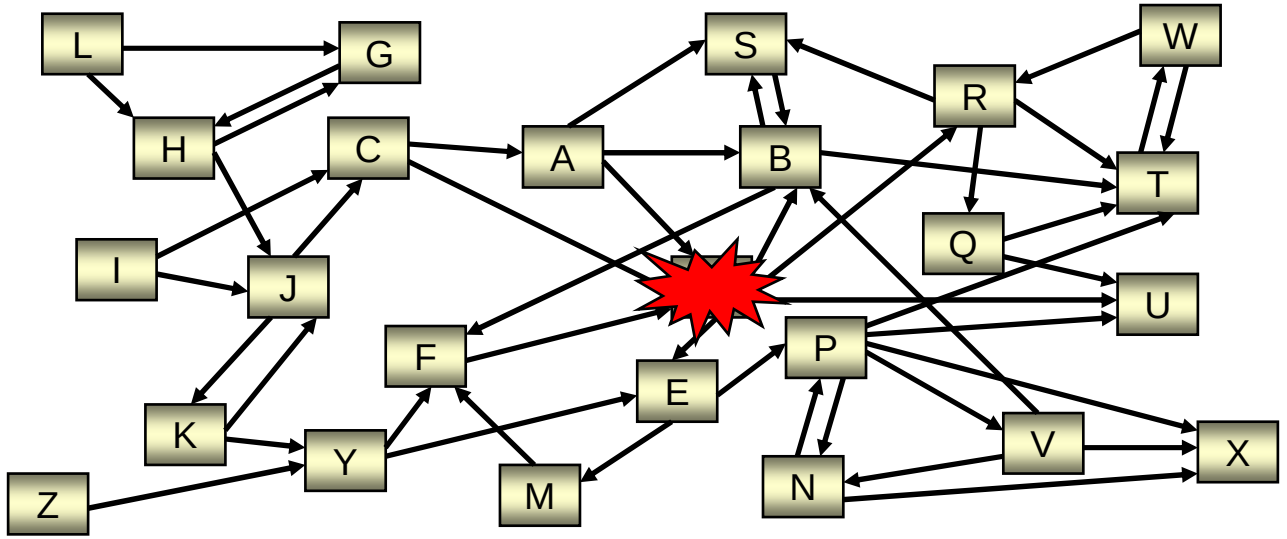
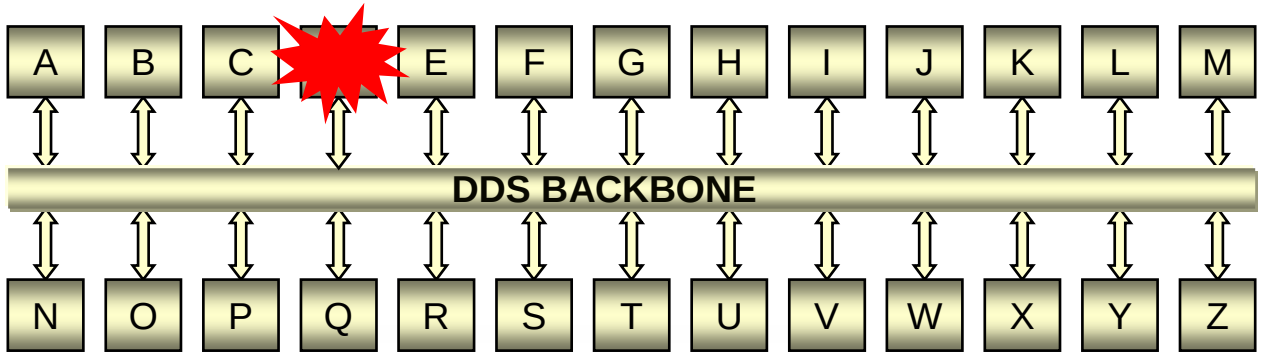
INTO THE MOOD

Into the mood: *'…Client/server vs. Pub-sub: A mind-shift…'*





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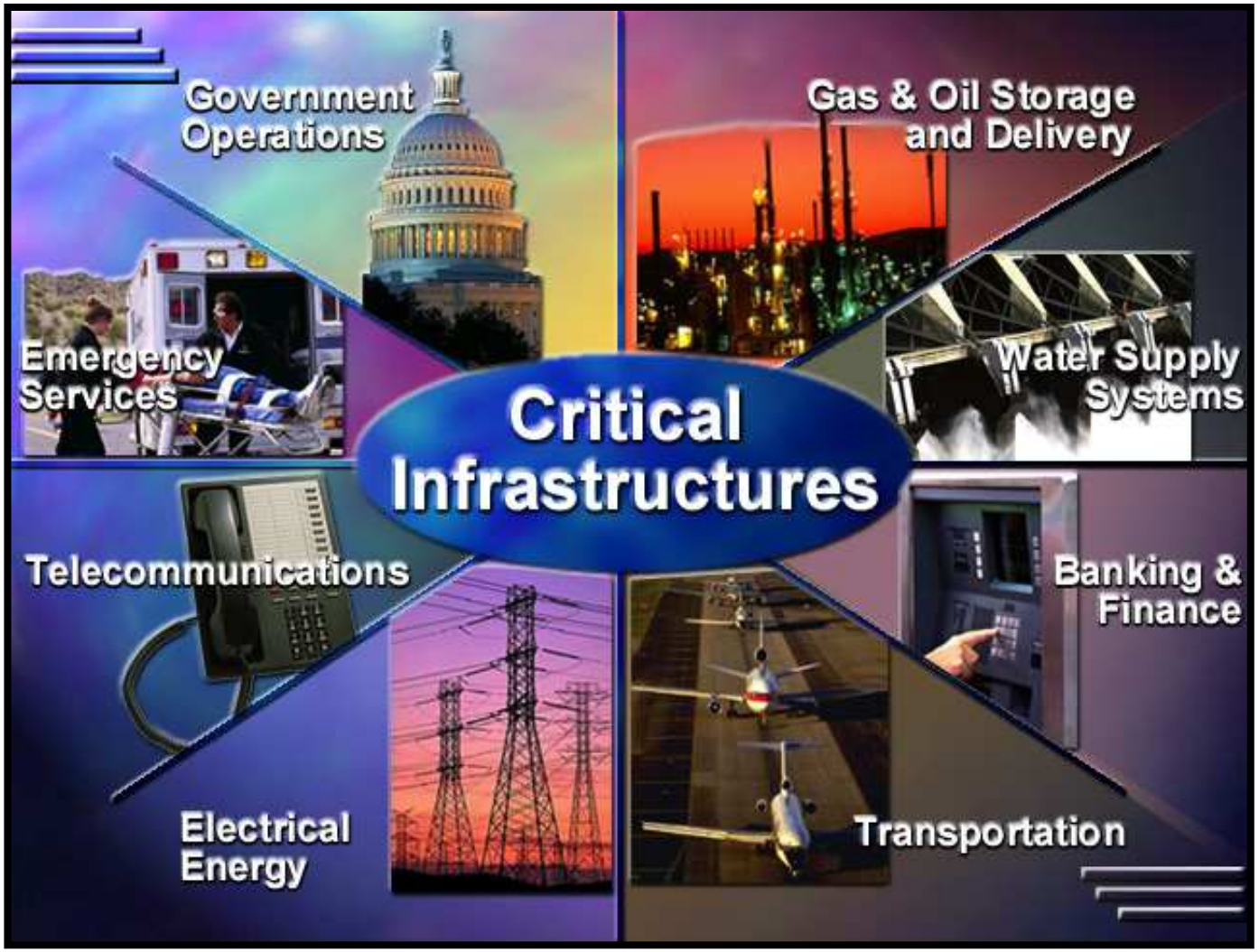
CRITICAL INFRASTRUCTURES

© ARMS (Doug Schmidt): R&D Challenge



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CIO/NII
Enabling Net-Centric Operations

The Move to Net-Centricity

Current		Net-Centric
Information stovepipes	→	Shared information
"Welded" interfaces	→	Unconstrained
Predetermined needs	→	Unanticipated users
Fixed display formats	→	User-defined info and formats
Need to know	→	Need to share; right to know
Rigid		**Agile**

Connecting People With Information

© DoD Chief Information Officer, Network and Information Integration, Nov'05

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DDS: a Fielded concept, suitable for mission-critical systems

CHARACTERISTICS

Many different customers:	*fielded in over 15 Navies world-wide*
Many different ships/missions:	*tens of Ships classes (patrol boats to destroyers)*
Large-scale & mission-critical:	*>150 CPU's, >2200 applications, >4.000 tracks/sec*
Real-time and Fault-tolerant:	*Battle-damage resistant, deterministic, reliable*

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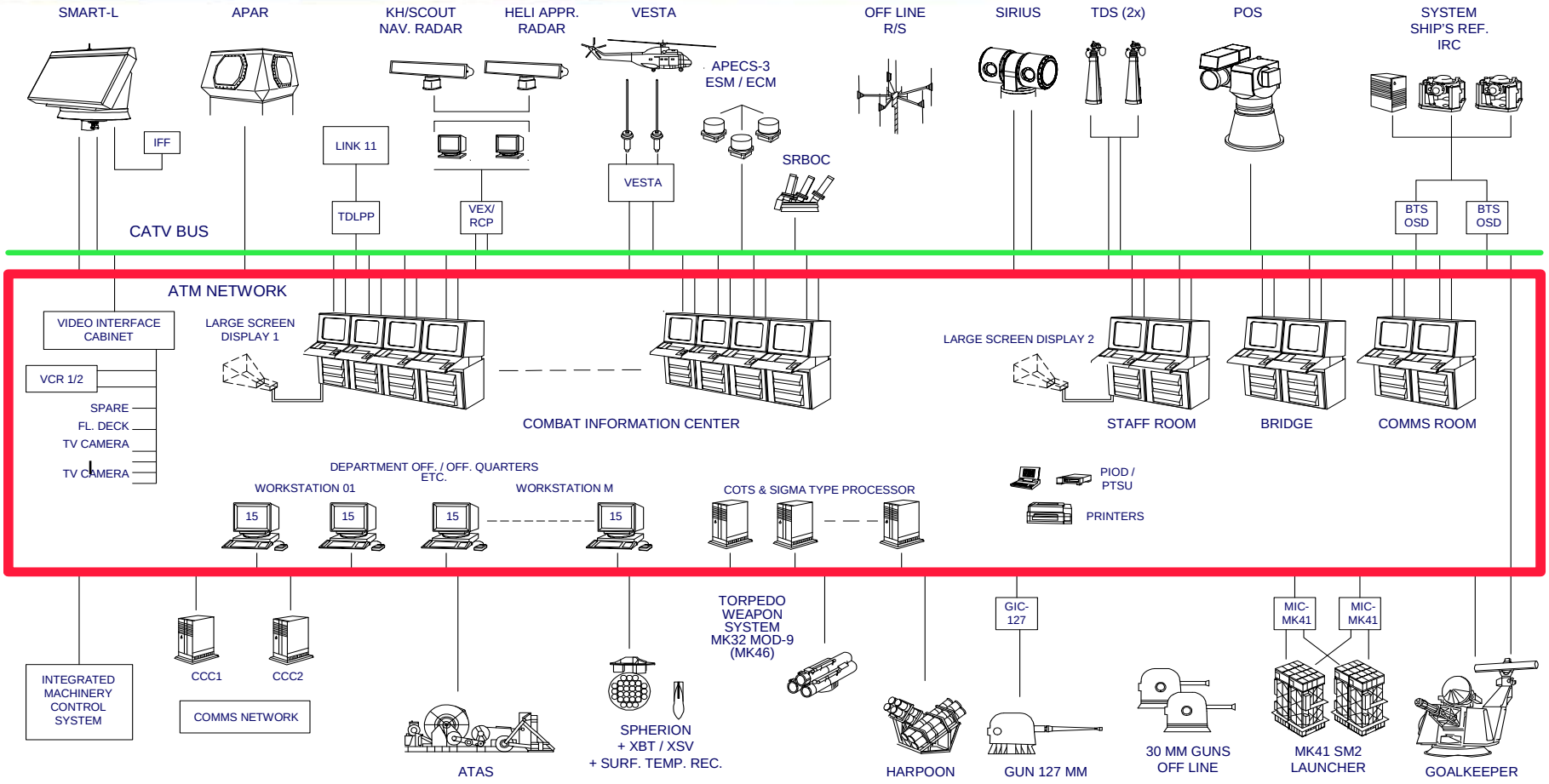
An Example: Naval Frigate Combat System



- **Data-traffic:** *>4.000 publications per second over the system-data bus*
- **Programs:** *2.200 programs allocated over 150 processors*
- **Data flows:** *urgent & non-urgent data (latency), important & less-important data (priority)*

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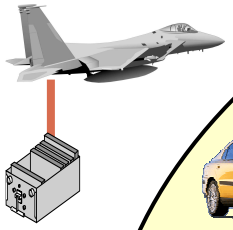
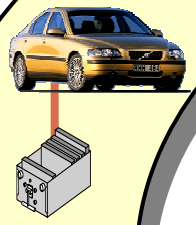
A MODEL FOR DDS-APPLICABILITY

SYSTEM SCOPES

Platform-centric systems

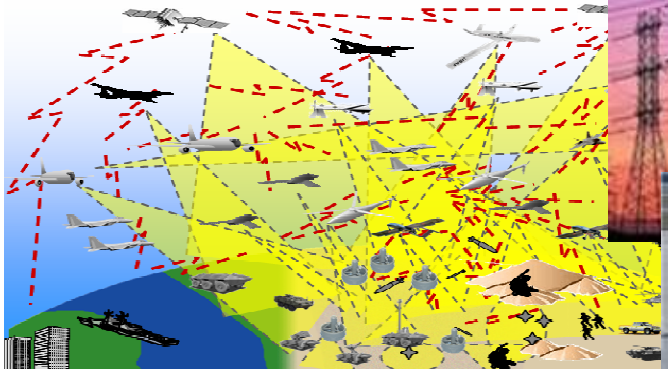




Net-centric systems

REQUIREMENTS

Net-centric systems-of-systems



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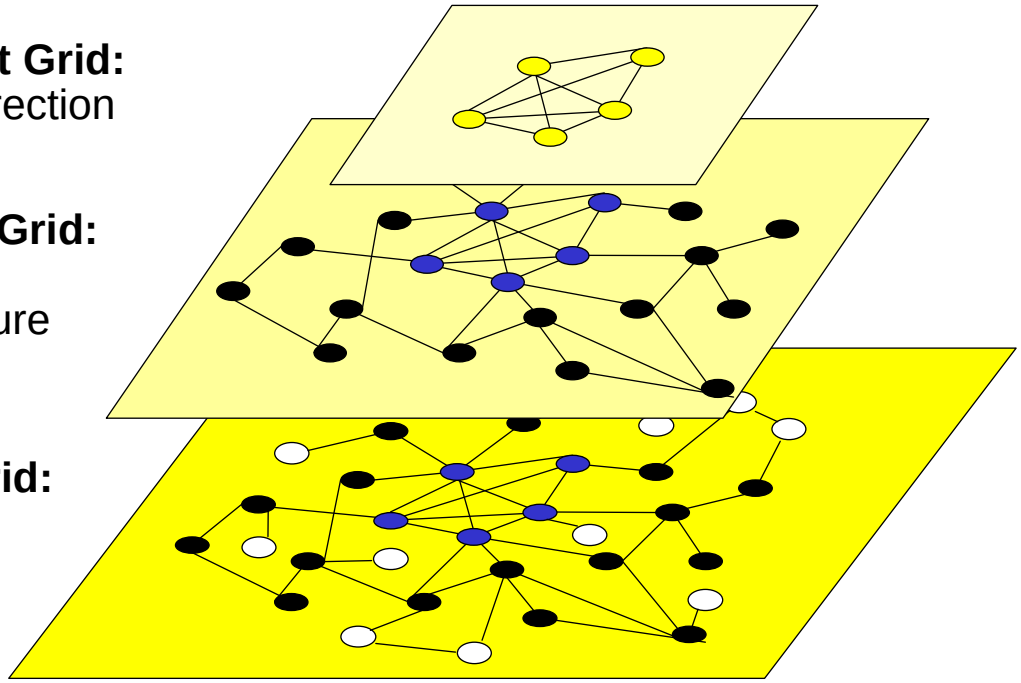
Information Grids in Net-Centric Operations (NCO)

Engagement Grid:
Weapons Direction

Awareness Grid:
Common
Tactical Picture

Planning Grid:
Common
Operational
Picture



Combat Execution (CE)

Command & Control (CC)

Command Support (CS)

- NCO: Autonomous processes, based upon ubiquitous information at required QoS

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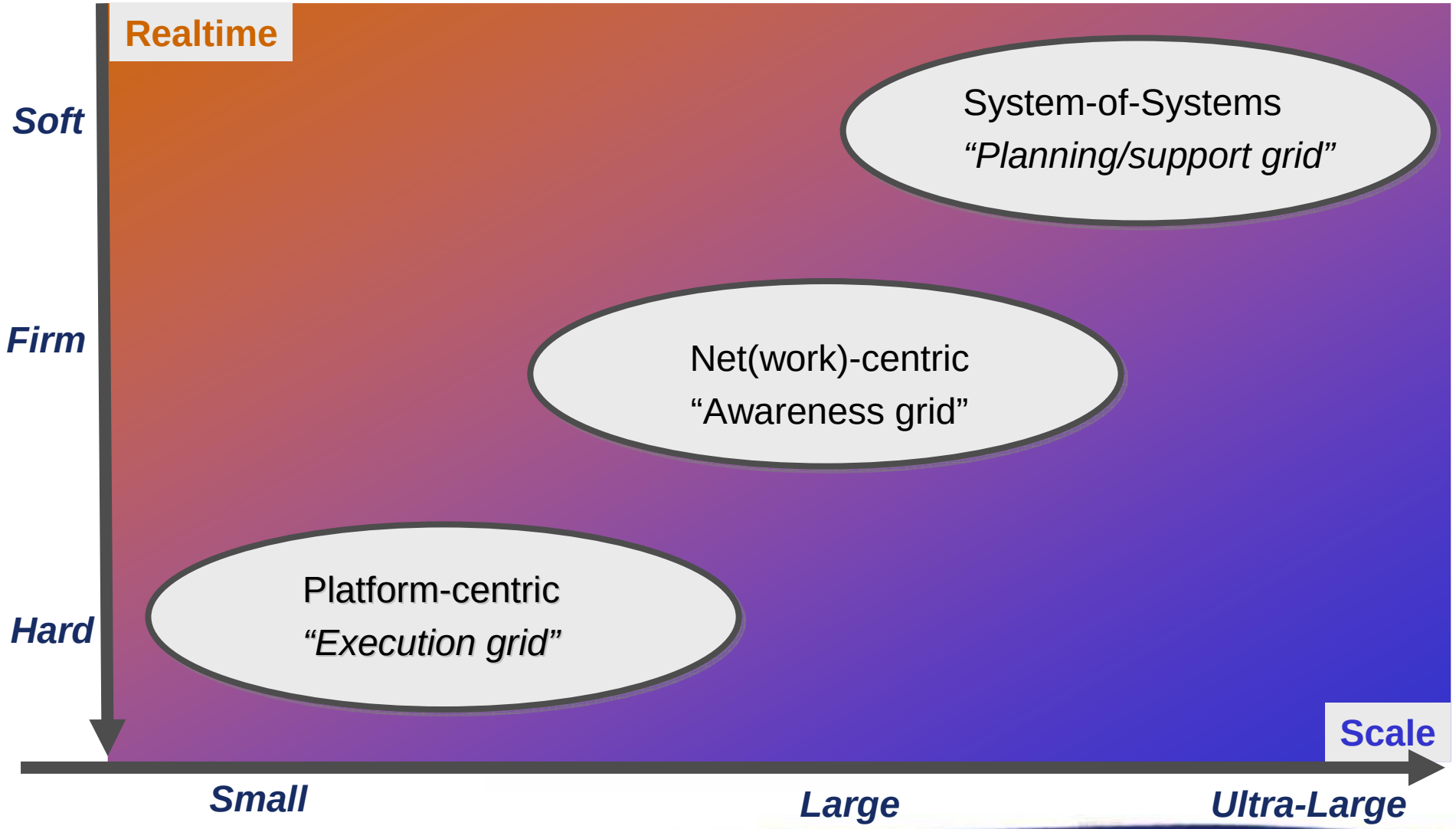
A MODEL FOR DDS APPLICABILITY



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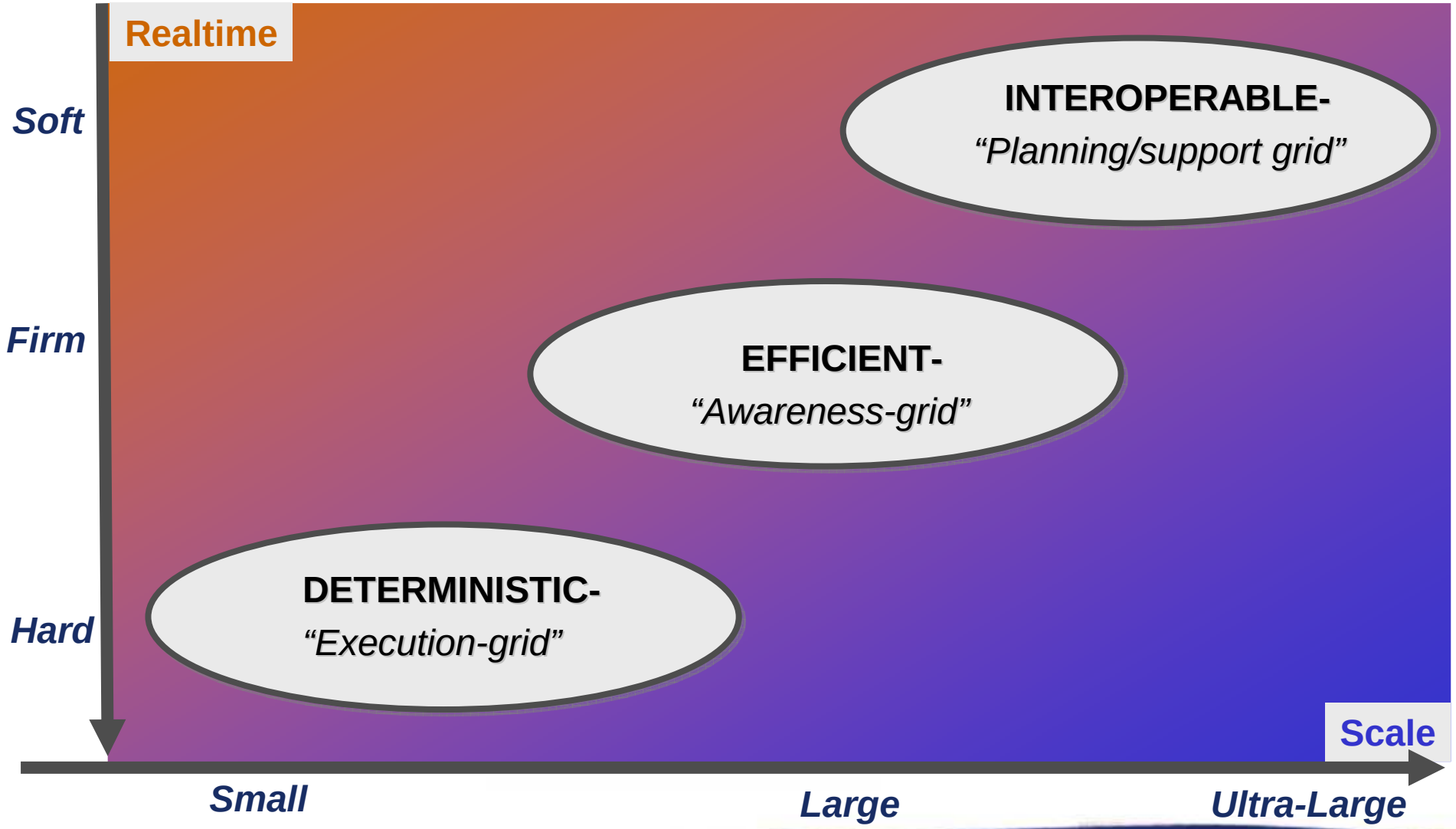
MAIN CHARACTERISTICS



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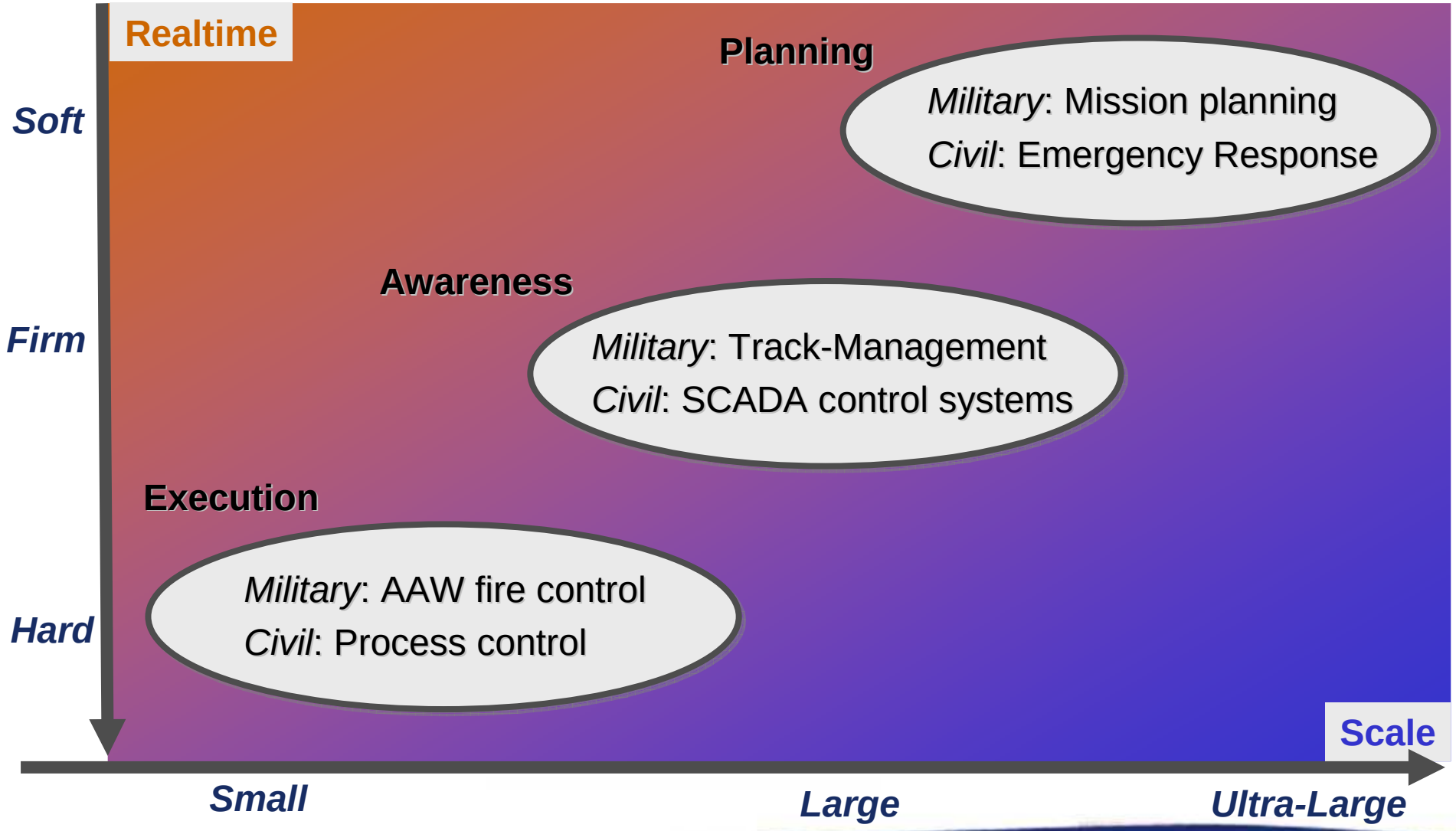
EXAMPLES



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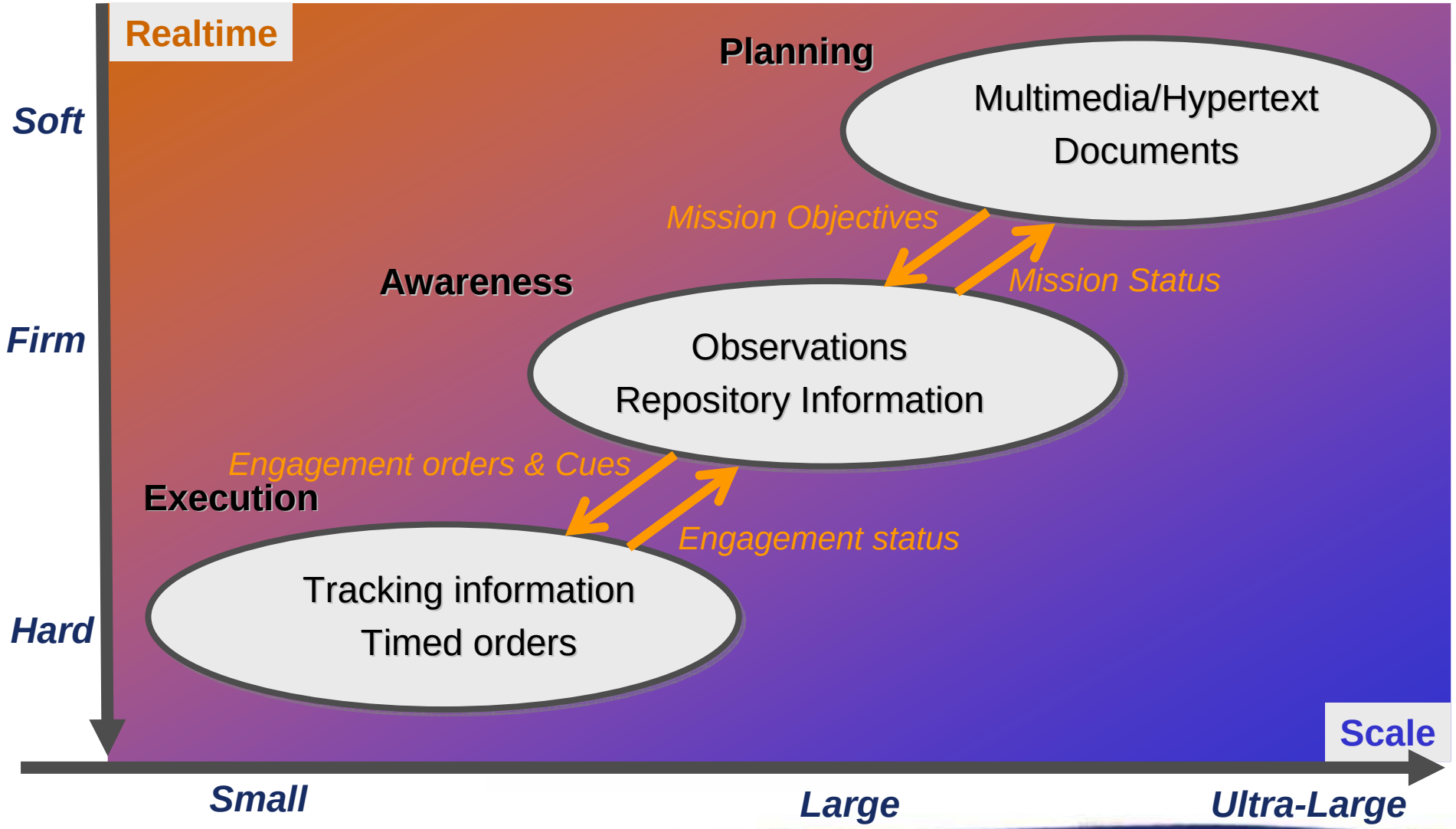
INFORMATION ARTEFACTS (Mil. Example)



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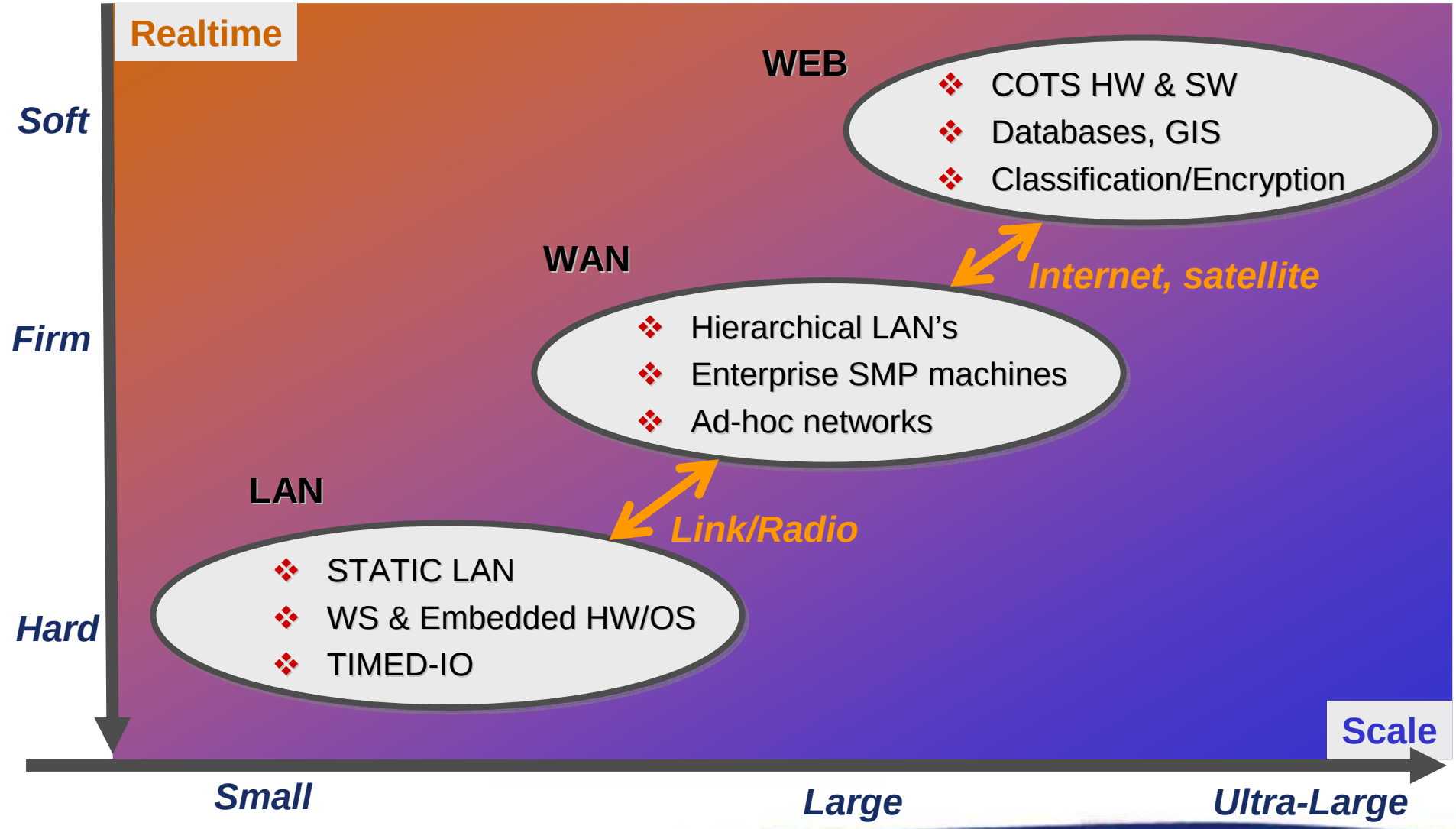
TECHNOLOGIES



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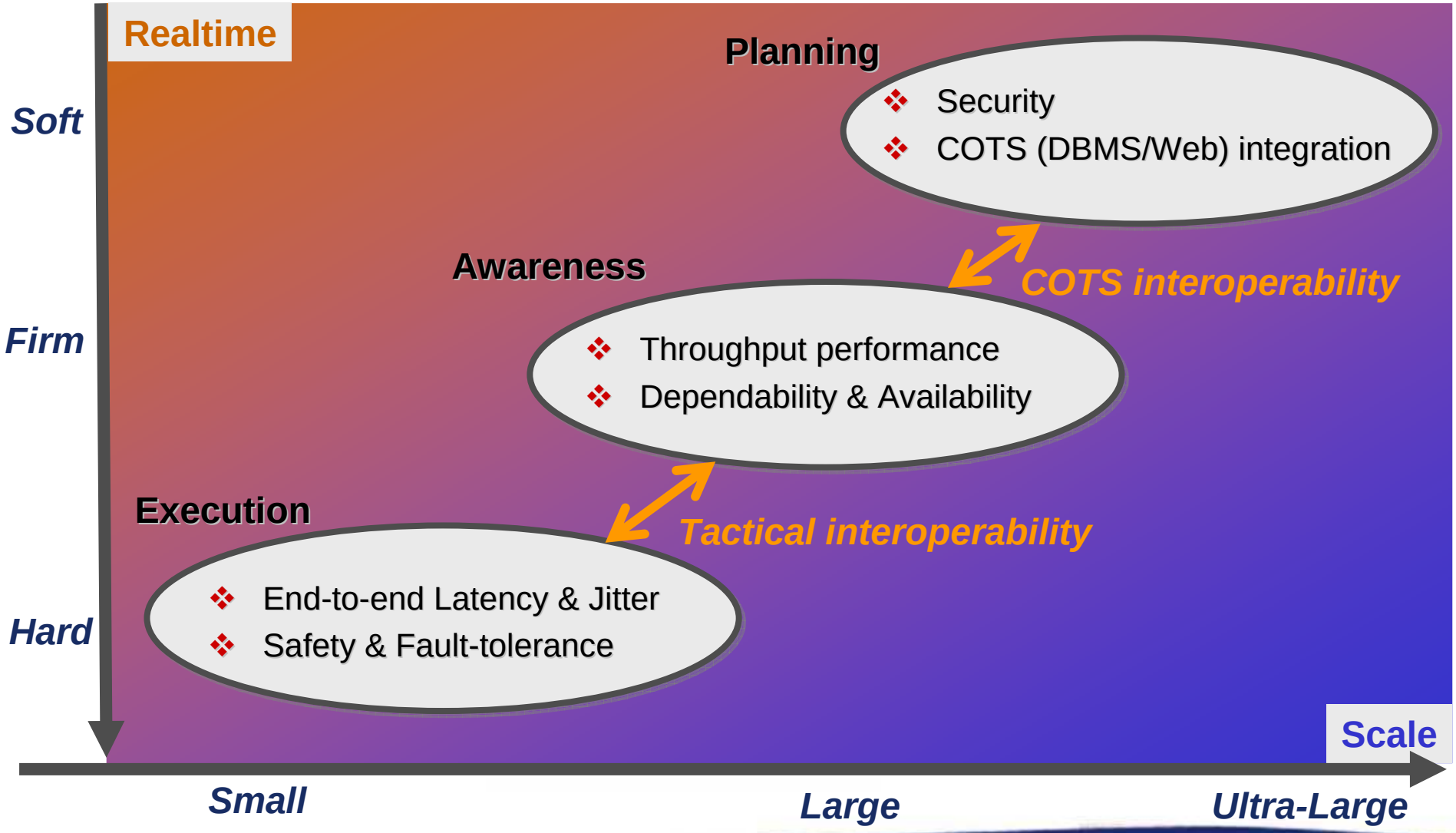
SYSTEM REQUIREMENTS



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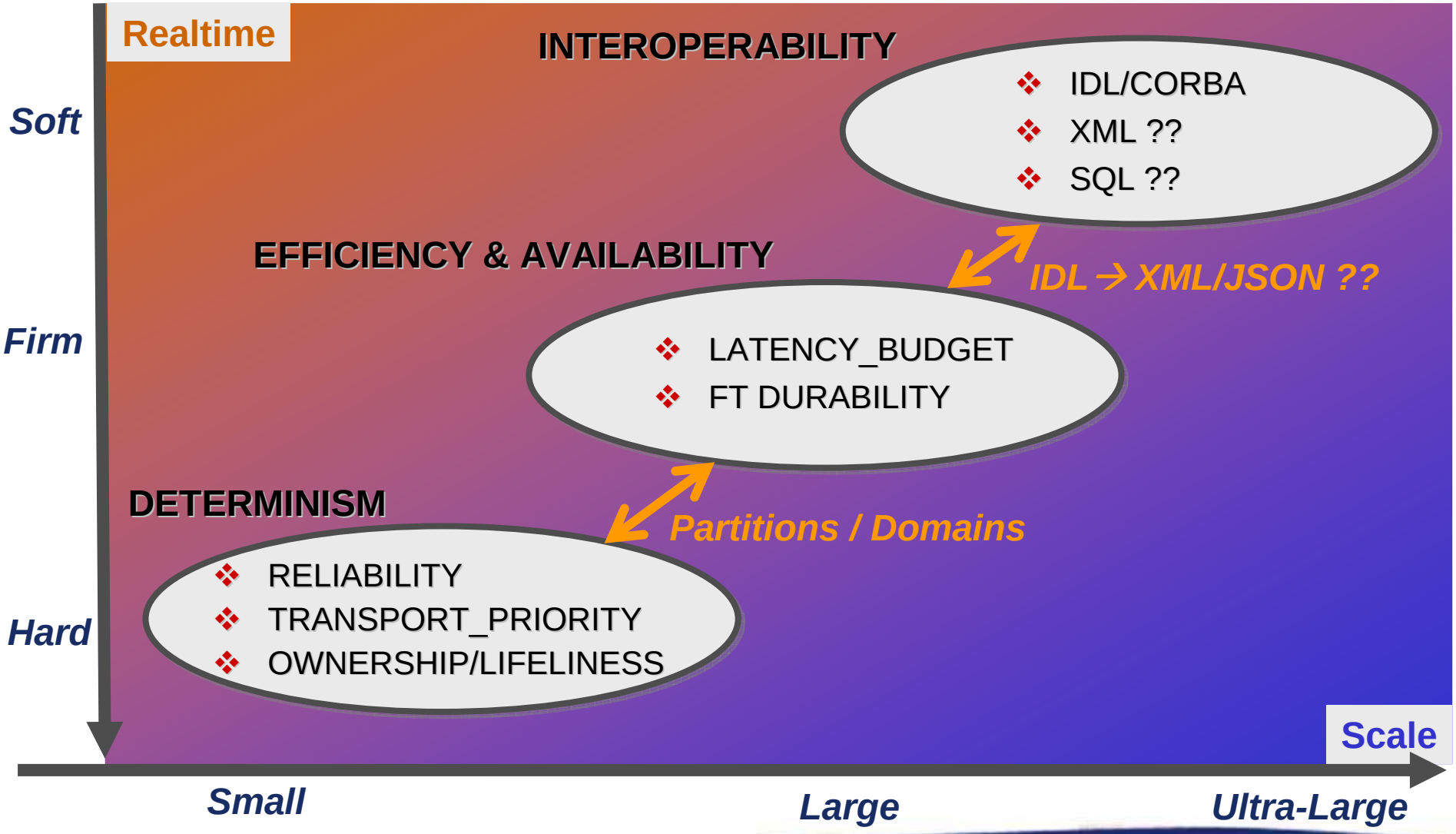
DDS-APPLICABILITY

DDS SUITABILITY: FUNCTIONALS (Specification)



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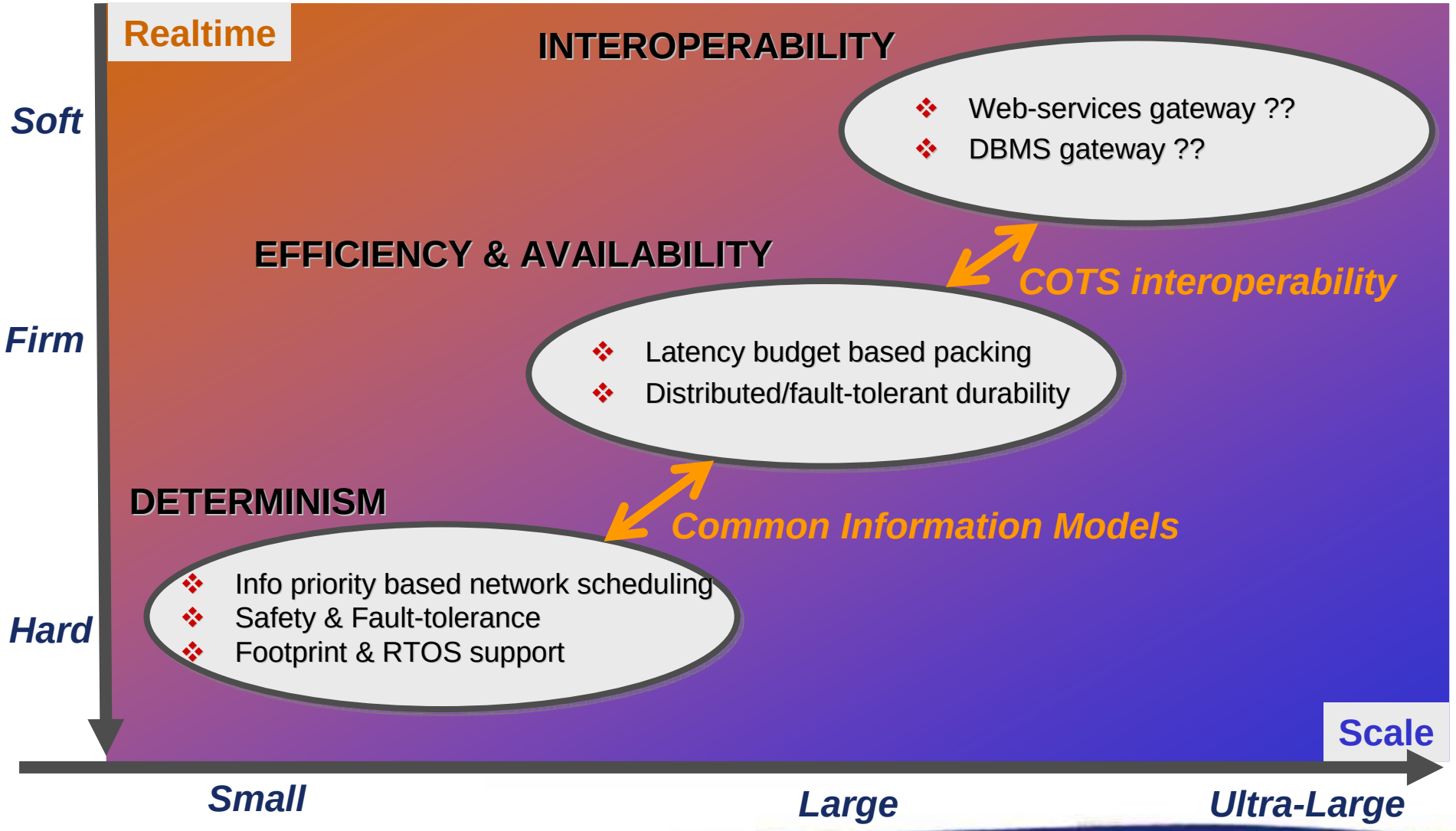
DDS SUITABILITY: NON-FUNCTIONALS (Implementation)



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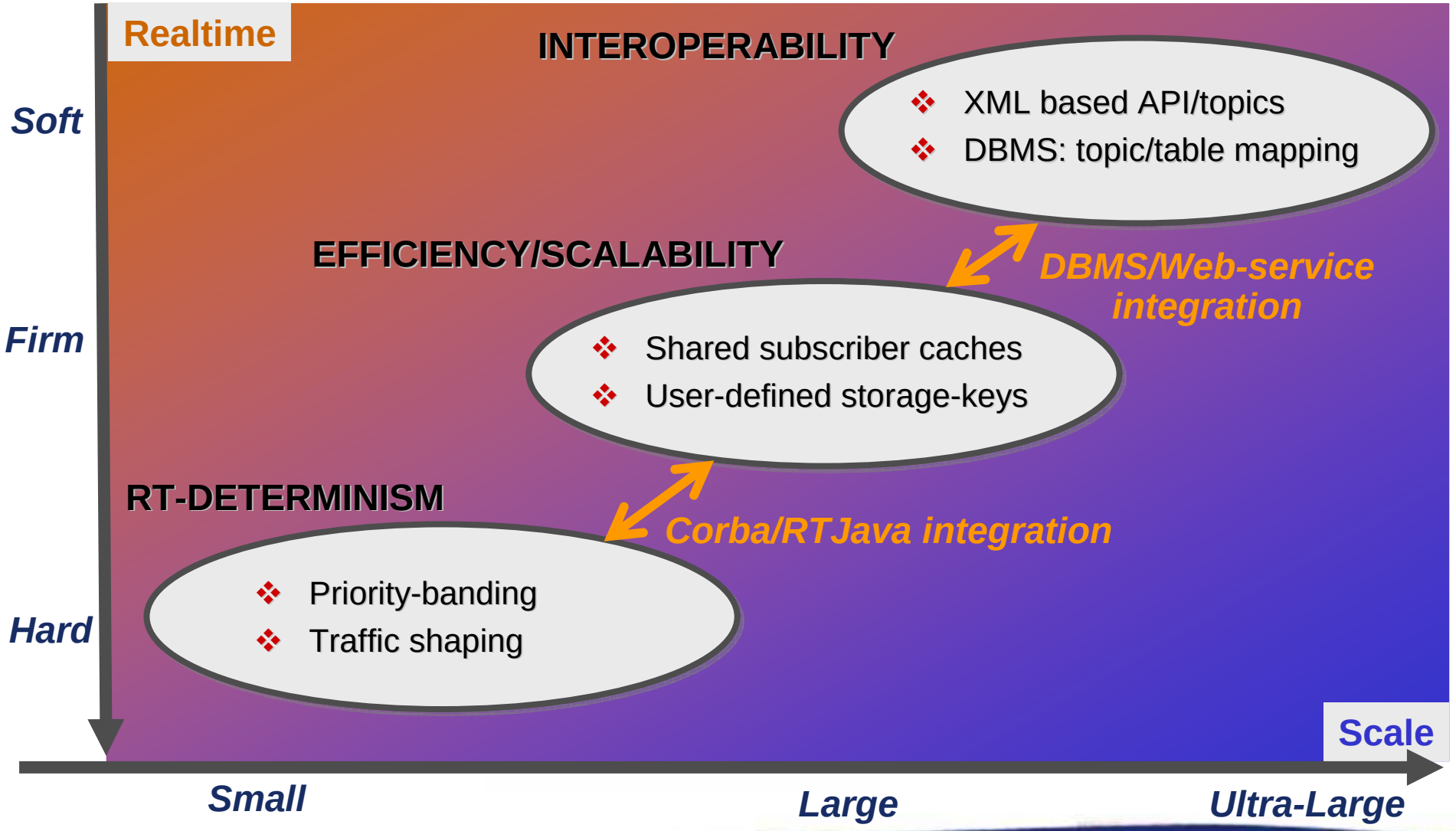
DDS SUITABILITY: Standardization Challenges



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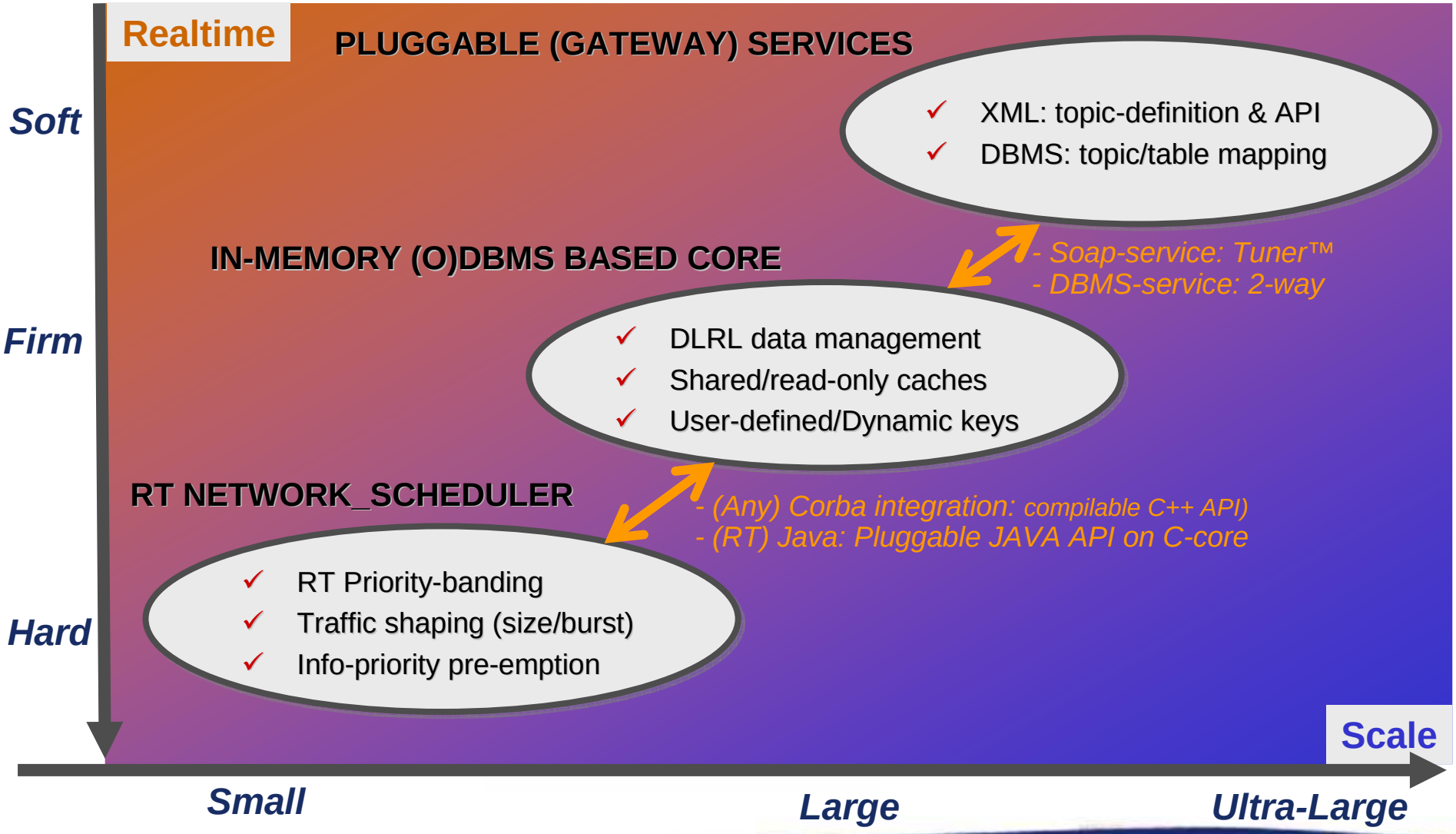
Use Case: OpenSplice
…. one size fits all … ???

USE-CASE: OpenSplice, Addressing the challenges



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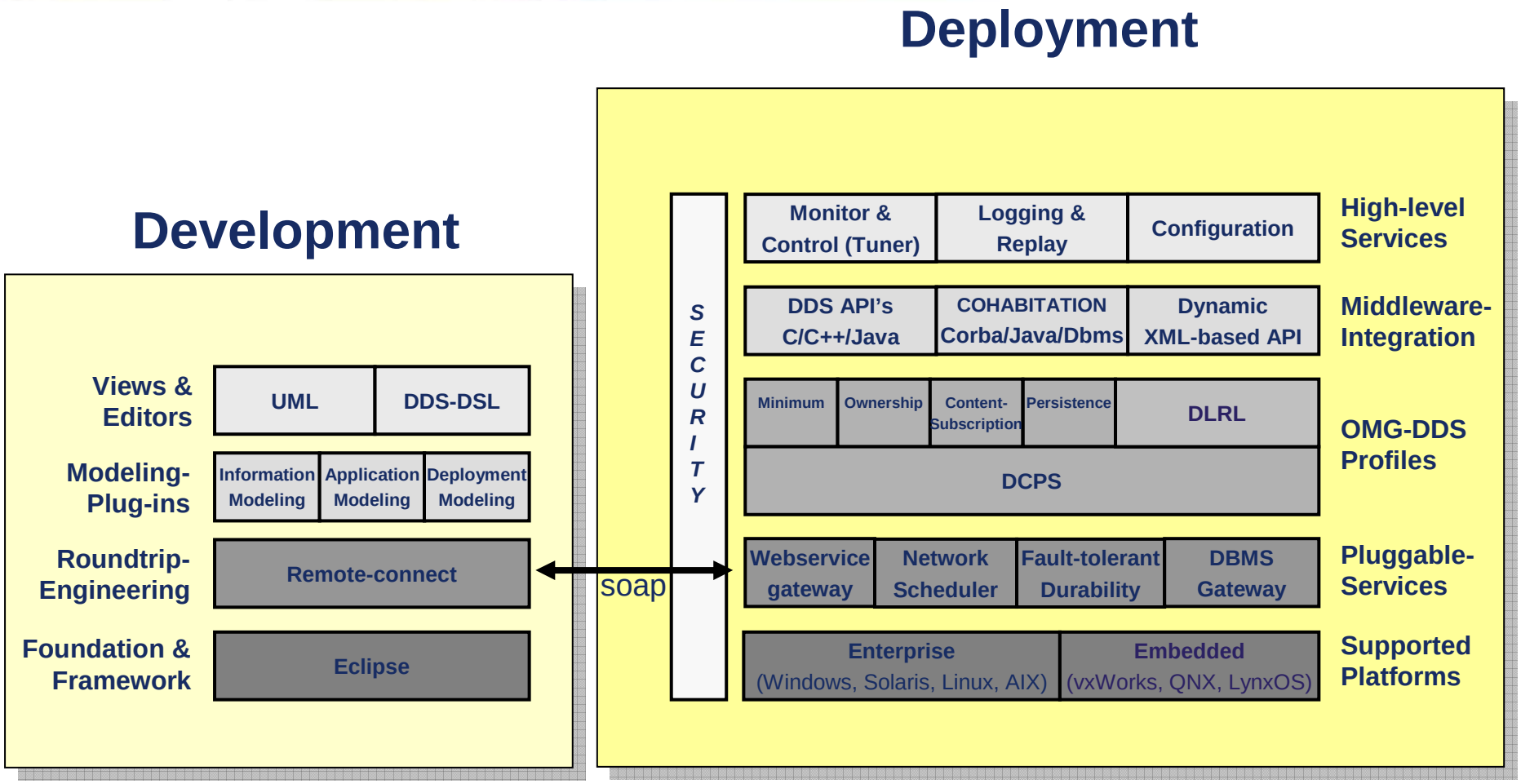
USE-CASE: Creating & Deploying DDS-based systems



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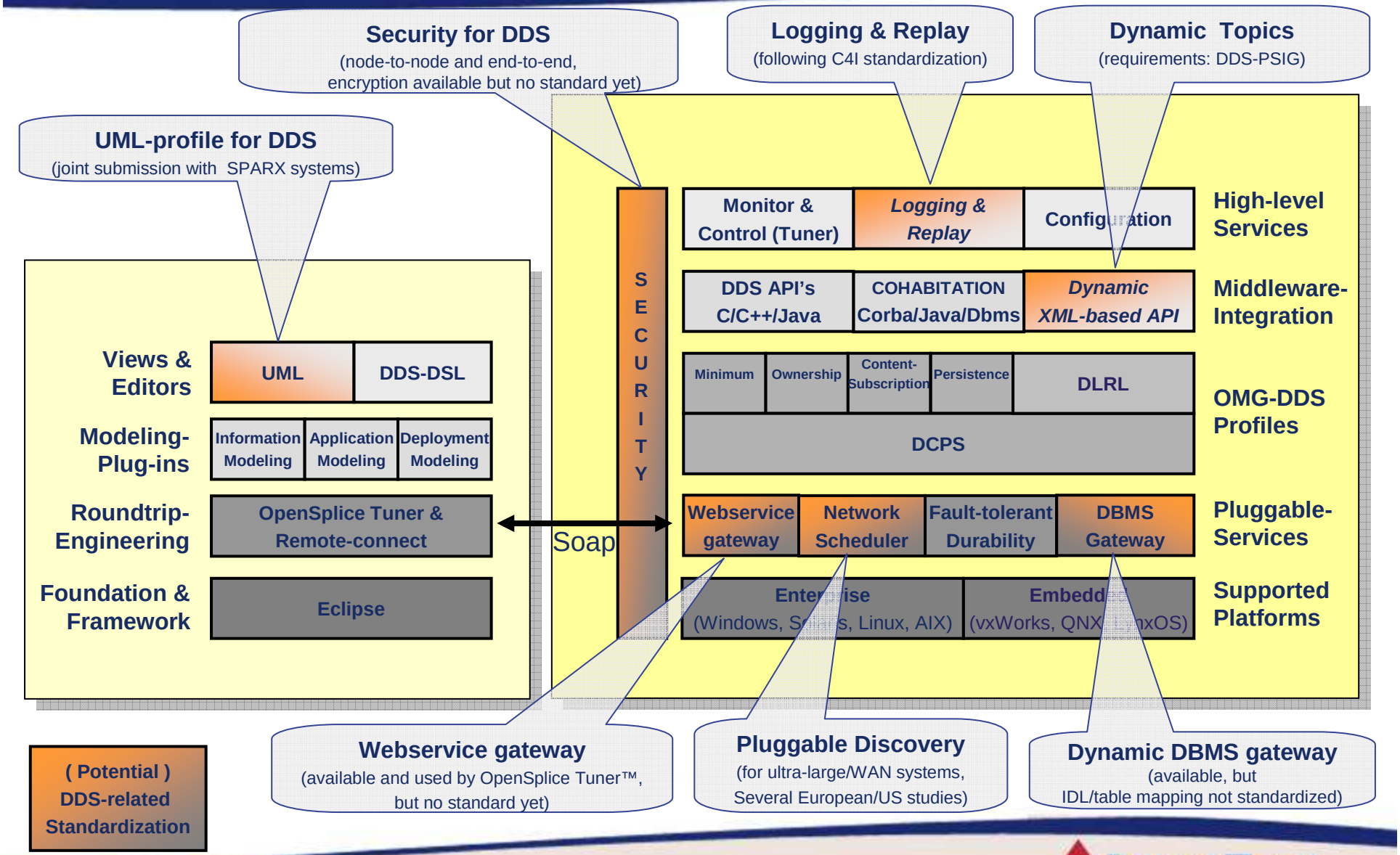
CONCLUSION: 'One concept' fits all, we're not there yet..



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….QUESTIONS….
?????

- THANK YOU !!
- Hans.vanthag@prismtech.com