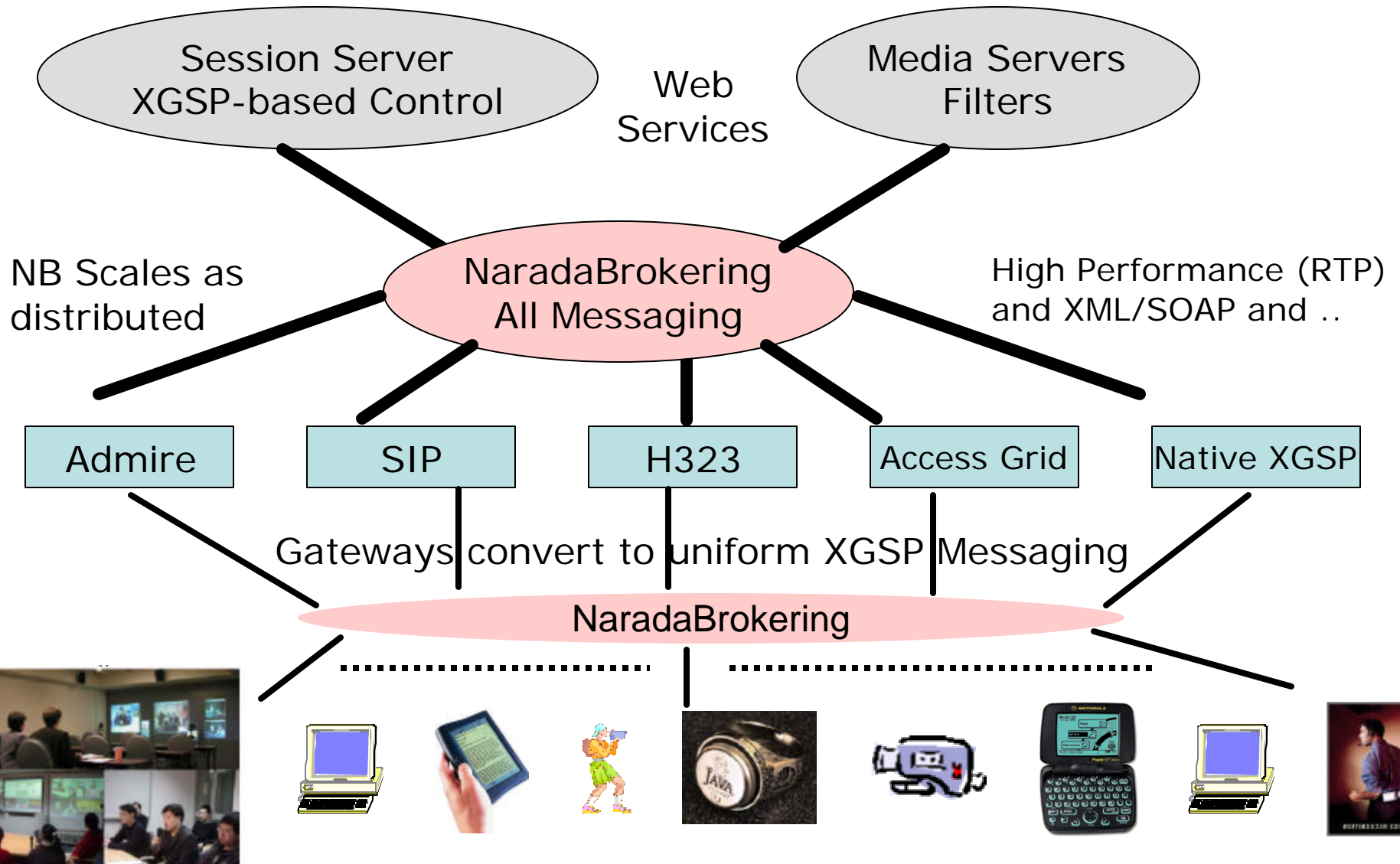


GlobalIMMCS Web Service MCU Architecture

Use Multiple Media servers to scale to many codecs and many versions of audio/video mixing

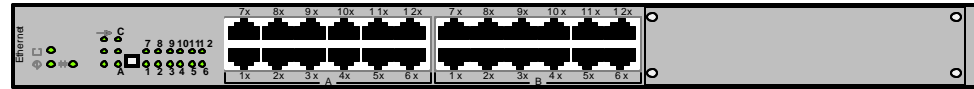


the biggest Laptop

NaradaBroker
AV Session Server
VIC (display)

Web Server
Image Grabber Server
Video Mixer Server
VIC3 -- Web Cam

H.323 Gateway
Real-Streaming Gateway

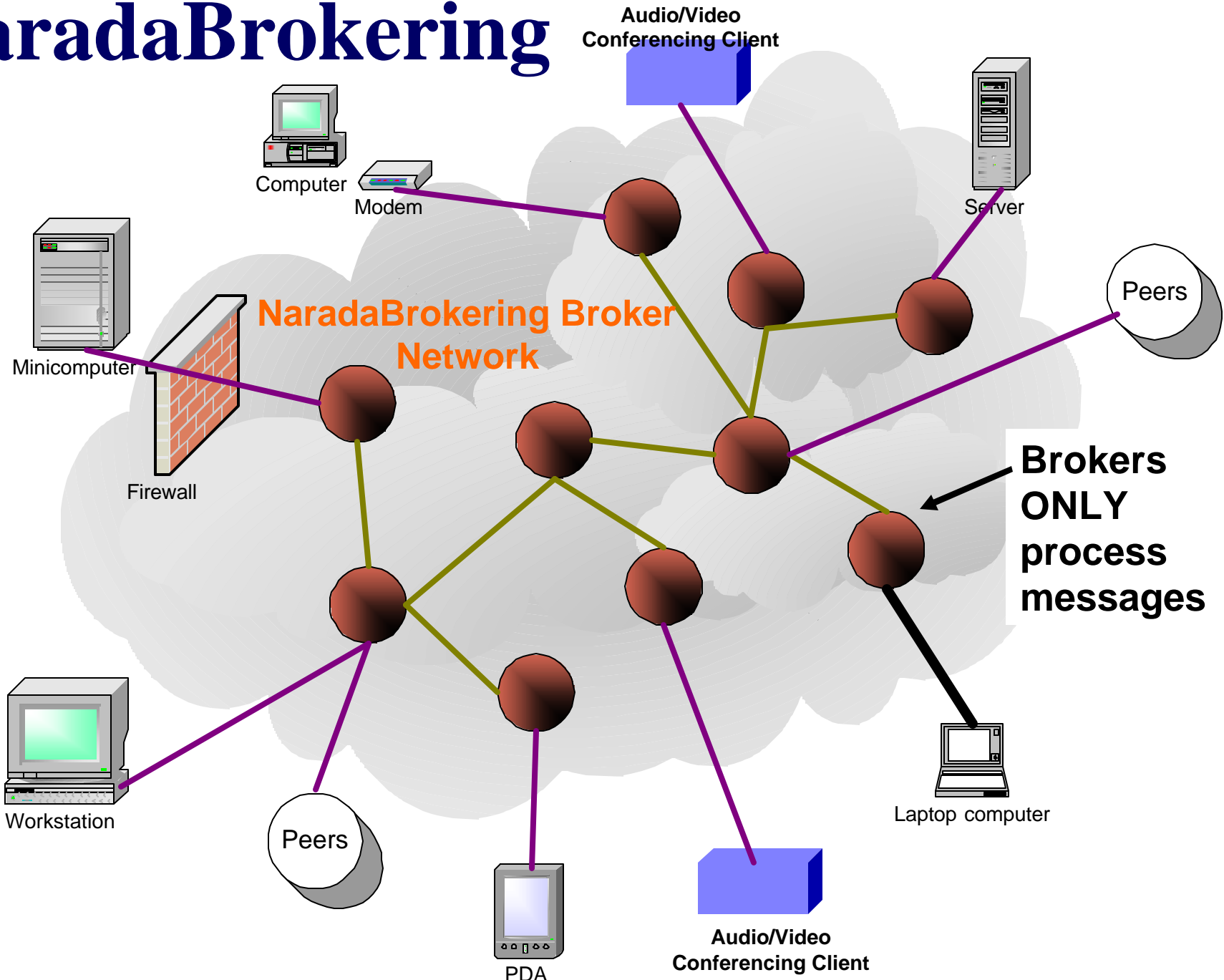


PolyCom Client
RealPlayer Client

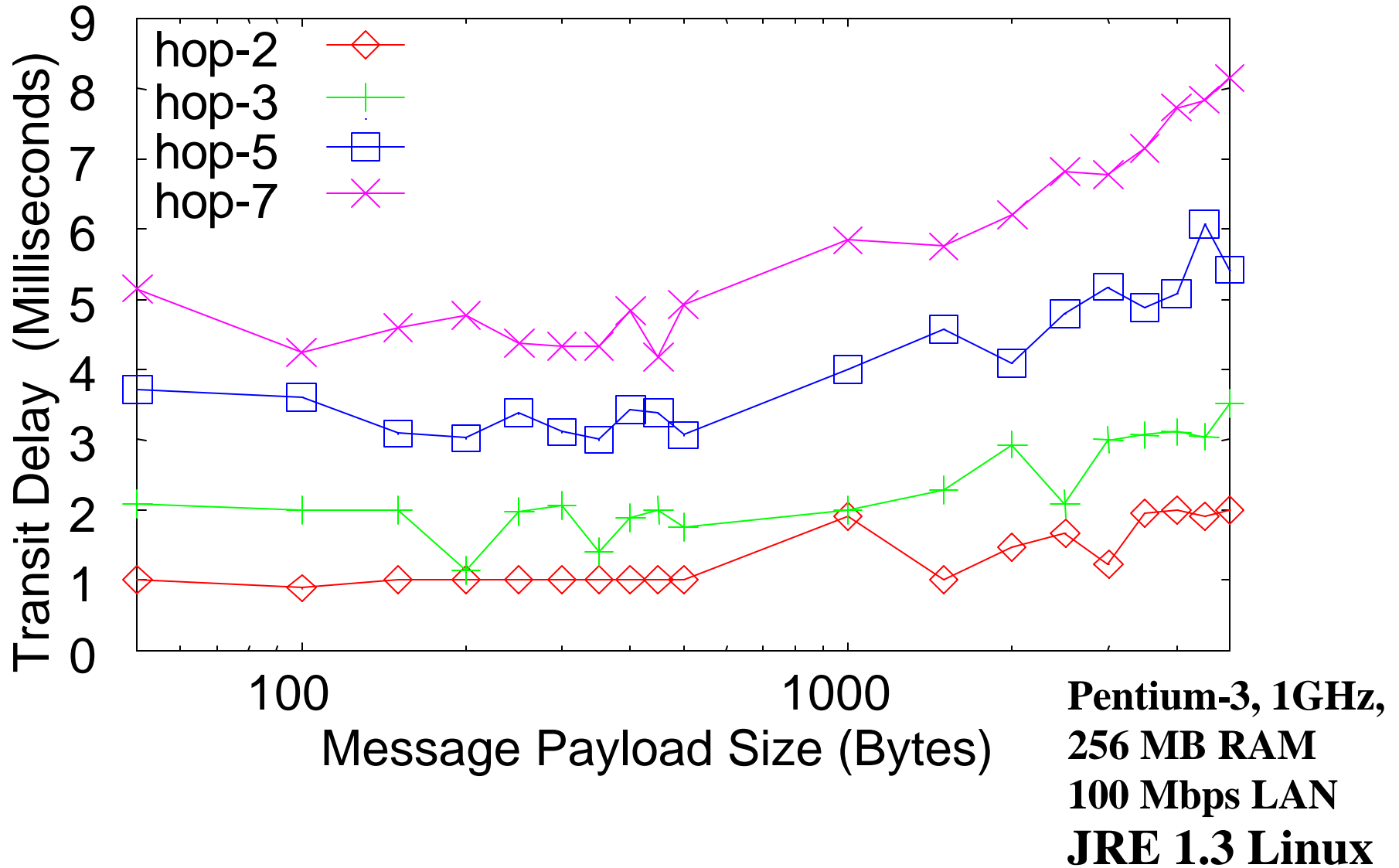
The smallest laptop
This Laptop showing the PowerPoint

VIC1 -- Web Cam Capture
VIC2 -- Screen Capture

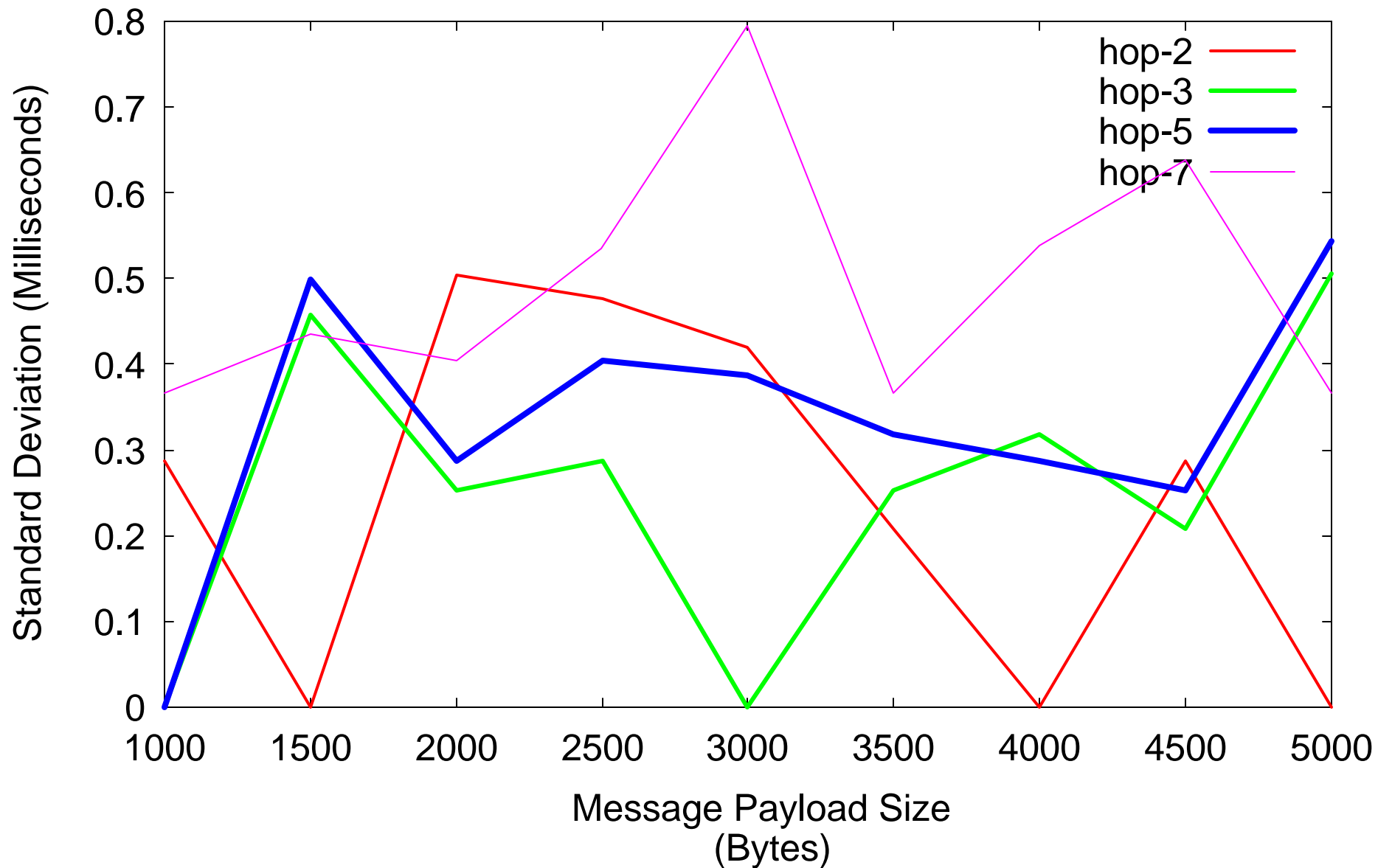
NaradaBrokering



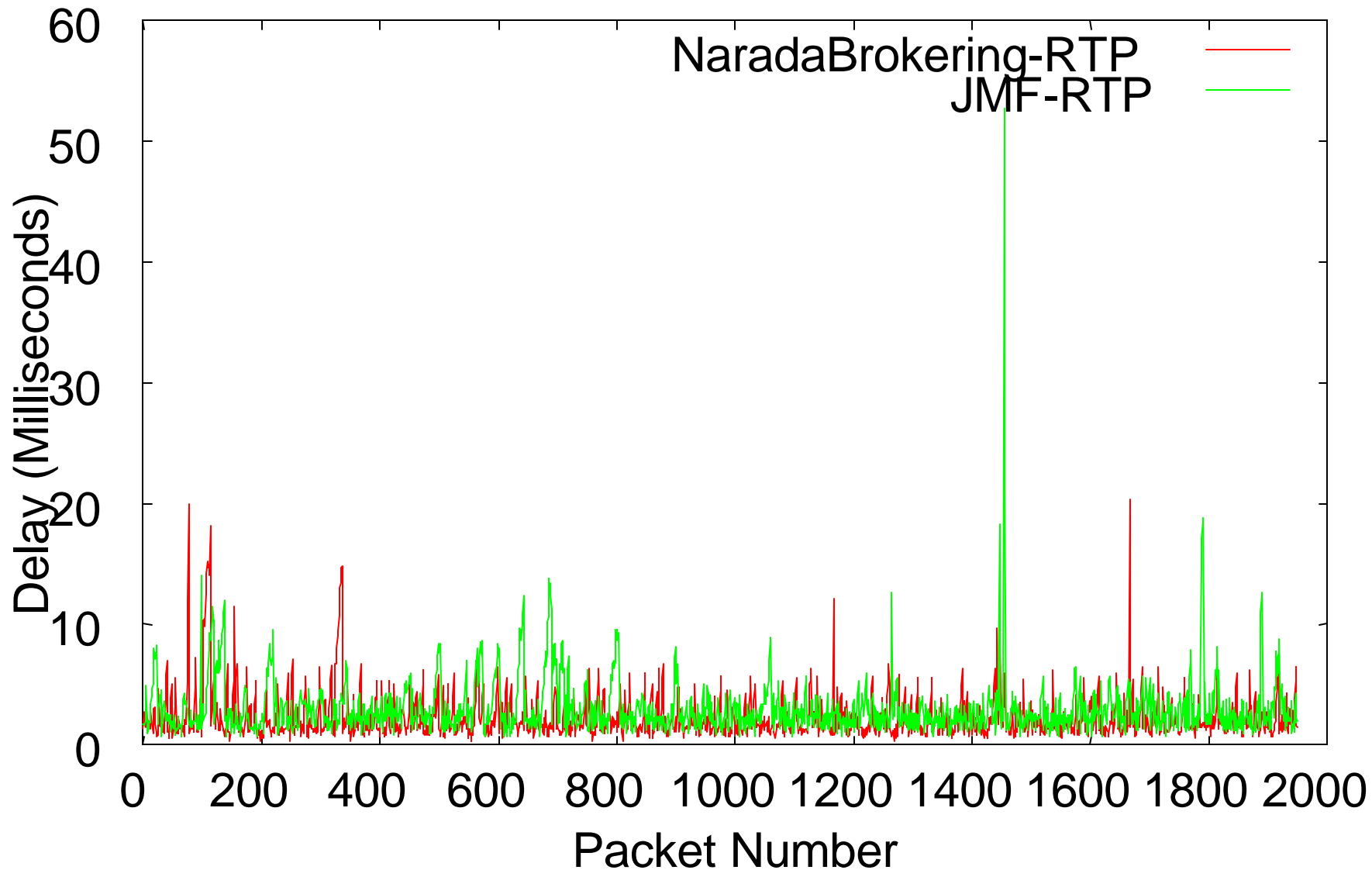
Mean transit delay for message samples in NaradaBrokering: Different communication hops



Standard Deviation for message samples in NaradaBrokering
Different communication hops - Internal Machines

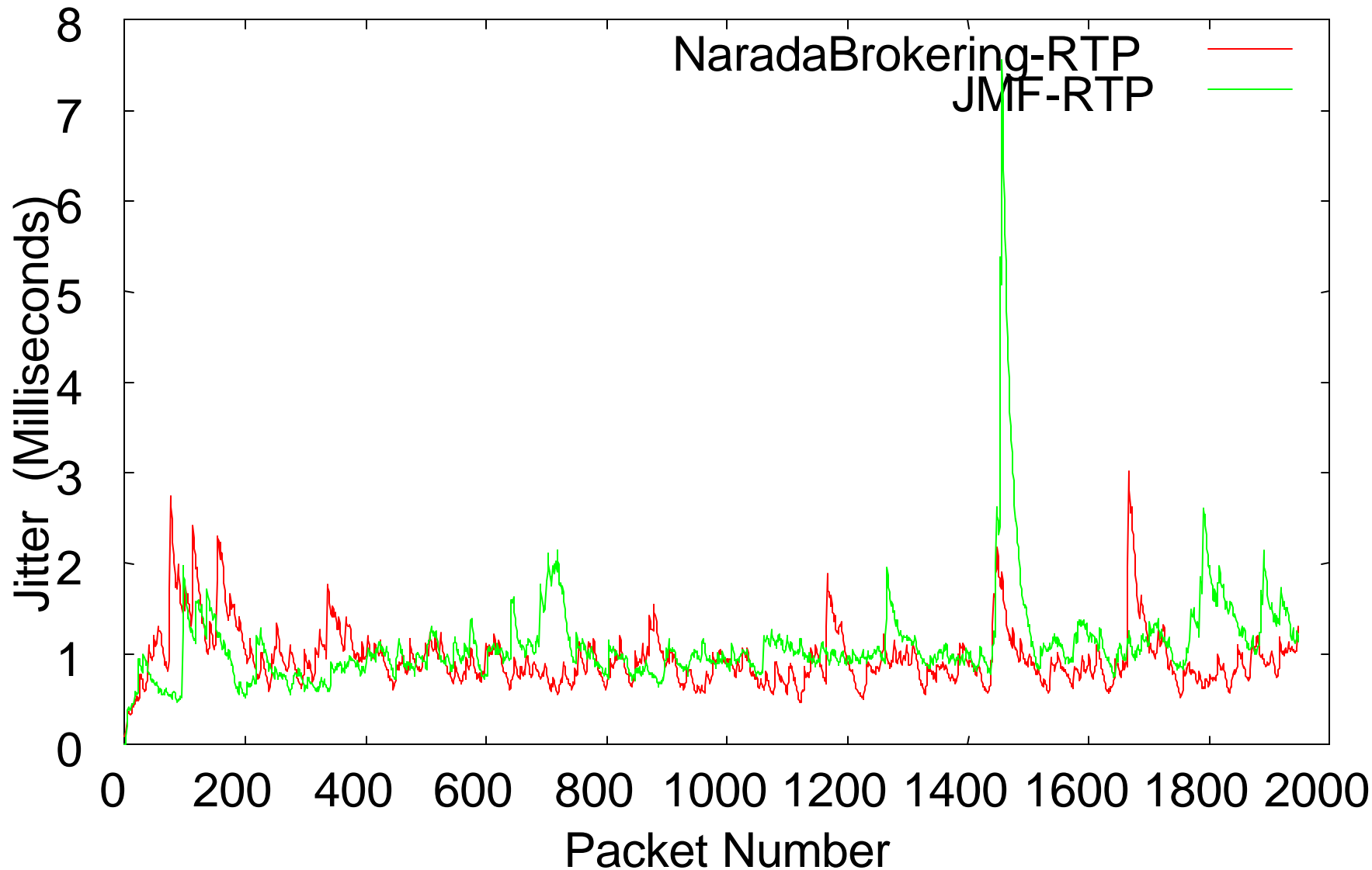


Average delays per packet for 50 video-clients
NaradaBrokering Avg=2.23 ms, JMF Avg=3.08 ms



Average jitter (std. dev) for 50 video clients.

NaradaBrokering Avg=0.95 ms, JMF Avg=1.10 ms



Functionality I	WebSphere MQ (formerly MQSeries)	Pastry	NaradaBrokering
Maximum number of nodes hosting the messaging infrastructure	Medium (MQ is based on the point-to-point model. There is a limit on the effectiveness of this mode in large configurations).	Very large	Very large
JMS Compliant	Yes	No	Yes
Guaranteed Messaging (Robust)	Yes	Yes	Yes
Support for routing P2P Interactions	No	Yes	JXTA and later Gnutella
Support for Audio/Video Conferencing & raw RTP clients	No	No	Yes
Communication through proxies and firewalls	Yes	No	Yes
Support for XPath queries/ subscriptions	No	Yes	Yes
end-to-end Security	Yes	No	Yes
Network Performance Monitoring	No	No	Yes

Functionality II	WebSphere MQ (formerly MQSeries)	Pastry	NaradaBrokering
Workflow Support	Yes	No	No
Support for P2P distributed caching	No	Yes (Squirrel)	No
Platforms or Hosting Environments	35 different OS/ platforms supported. Also supports the Java Platform.	Supported on platforms which support C# (Microsoft) or Java (Rice).	Platforms supporting Java 1.4 (tunneling C++)
Maturity of Software	Extremely mature, with very robust diagnostic information	Fair	Fair with some “production” testing
Transport Protocols Supported	TCP, HTTP, Multicast, SSL, SNA etc.	TCP, UDP	TCP (Blocking and non-blocking), UDP, Multicast, HTTP, SSL, RTP, (GridFTP)
Multiple transport protocols over multiple hops.	Yes	No	Yes
Broker Network Design Interface	No	No	In Progress

Integration of PDA, Cell phone and Desktop Grid Access

