

# **Grid Technology: Where Next?**

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# Inferno Grid Technology

- Originally Created by Lucent Technologies' Bell Labs
- From the same researchers who developed:
  - The UNIX Operating System and
  - The C Programming Language
- A portable environment for creating Grids across
  - Windows (2000, NT, XP)
  - UNIX
  - Linux
  - MacOS X
  - Embedded environments
- Inferno is the result of 20 years of research into distributed systems



# Grid Computing – where did the term come from?

- By Analogy with the Electricity Grid
  - Many different types of power station
  - Many different appliances
  - One type of Electricity
- Computer Grids
  - Many different types of computer
  - Many different applications
  - But can computing resources be used in a uniform way?



# Who needs a computational Grid?

- Anyone who does HARD SUMS and
- The SUM takes longer than the request to do it
- Scientists do hard sums
- And so do more and more companies
  - Financial Sector
  - Life Sciences
  - Data Warehousing and Data Mining
- Where will the computing power come from
  - Super Computers
  - Computing clusters
  - Desktop grids

# Where Next? Enterprise Grids

- Solving computational problems within an organisation
- New technologies are driving down costs
  - Super Computers are no longer the only solution
- Focus is on solving problems and getting work done
- But, not all technologies are easy to use
- Grid vendors like us are focusing on
  - Ease of installation and use
  - Administration
  - Reliability
- And we are all keeping an eye on Standards

# Grid Standards

Web Services

SOAP

WSpolicy

GridFTP

WSDL

Globus

OGSA/OGSI

WSaddressing

And others...

- The size, scope and scale of these is important
- If too big and too broad they wont solve any problems
- Which protocols do we use as standard on the Internet  
ARPA's or OSI's?
- *“The one good thing about grid standards is there are plenty to choose from”*



# We can learn a lot from history

- There are many parallels with the complex computing landscape of the 1960's and 1970's
- Back then the problem was data: we have UNIX to thank for solving that one
- The solution was simple not complex
- Now the problem is distribution



# Grid Computing should be as simple as this

- UNIX gave us the idea of a computational pipeline

a | b | c

- The output of one program is connected to the input of the next; but all programs are executed on the same computer
- The Inferno Grid allows you to do the same but to specify any program to run across the grid

a | grid b | c

- Existing programs should not have to change



# Summary

- Enterprise Grids are the medium term commercial focus
- Grids are currently built, not bought
  - Vita Nuova and others are striving to reverse the emphasis
- Standards are emerging for inter-organisation grids; but
  - Standards don't address cultural issues
  - Are you happy to have your data go outside the organisation?
- Grids won't live up to the analogy for quite some time