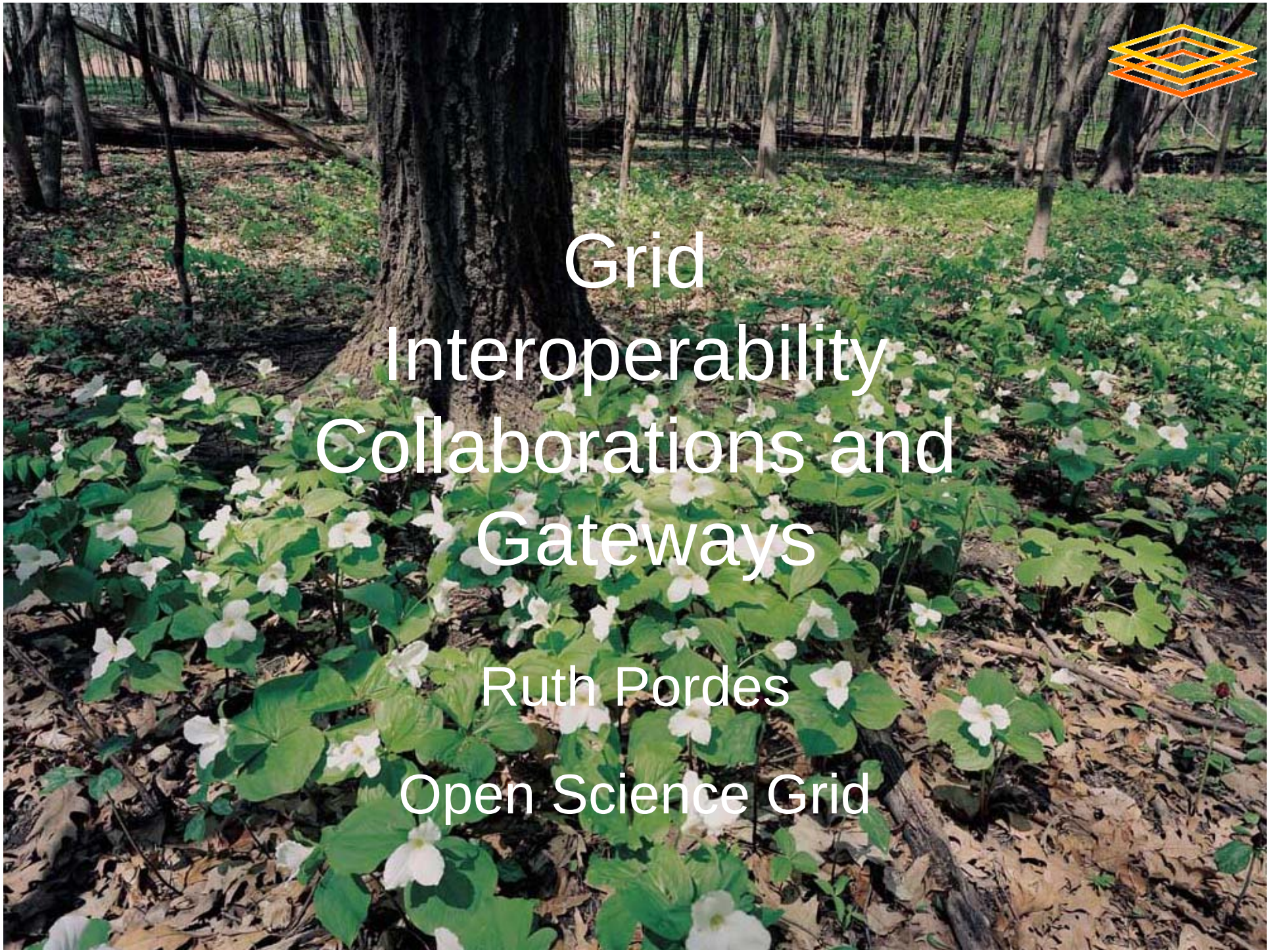


Grid Interoperability Collaborations and Gateways

Ruth Pordes

Open Science Grid

Interoperability (wikipedia)

…is the ability of products, systems, or business processes to **work together** to accomplish a **common task**..

….taking into account social, political and **organizational factors**.

Work Together  Collaborate

Interoperability of Software

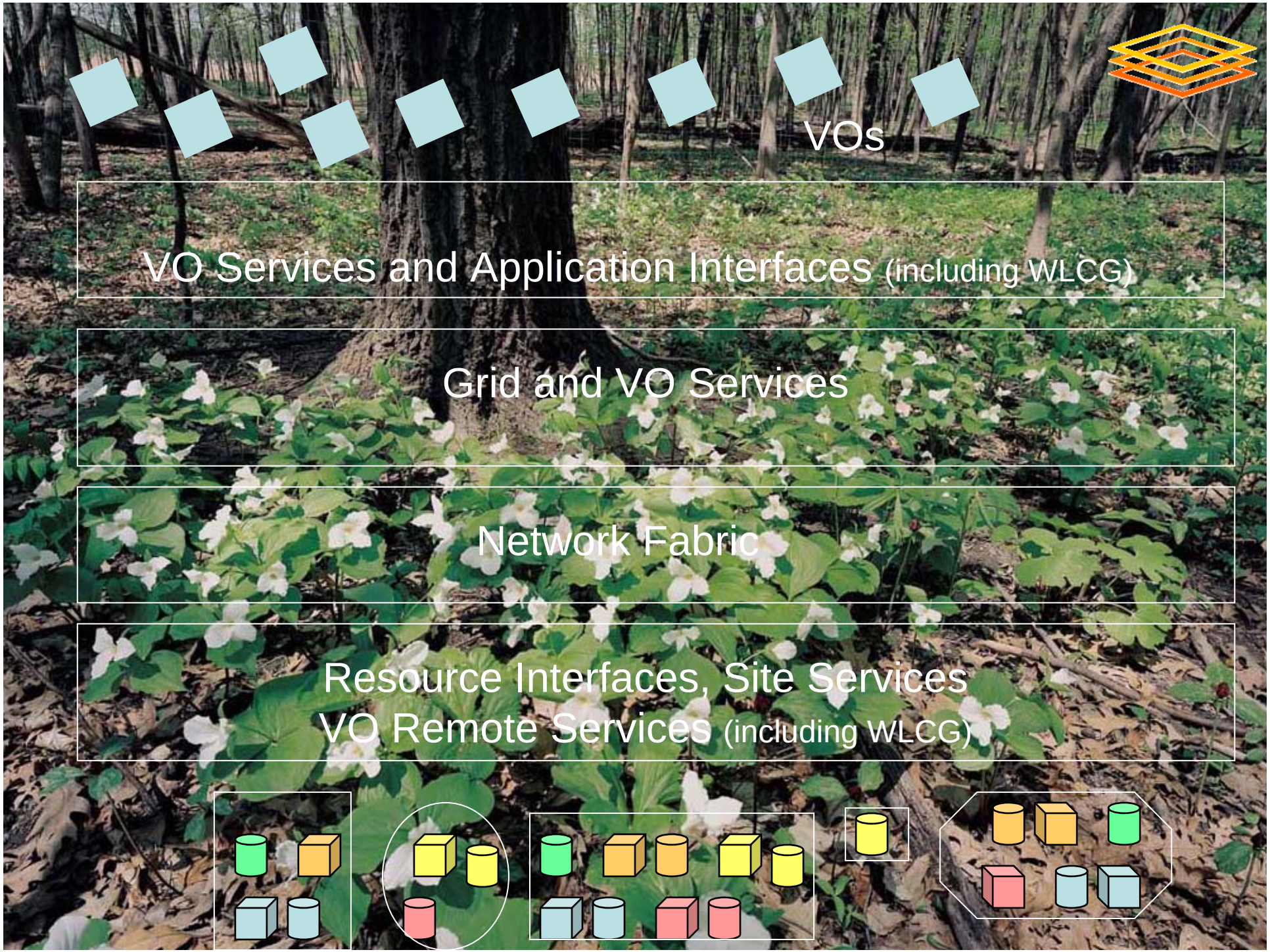
…. the **capability of** different programs to **exchange** data **via a common set** of business procedures, and to read and write the same file formats and use the same protocols.

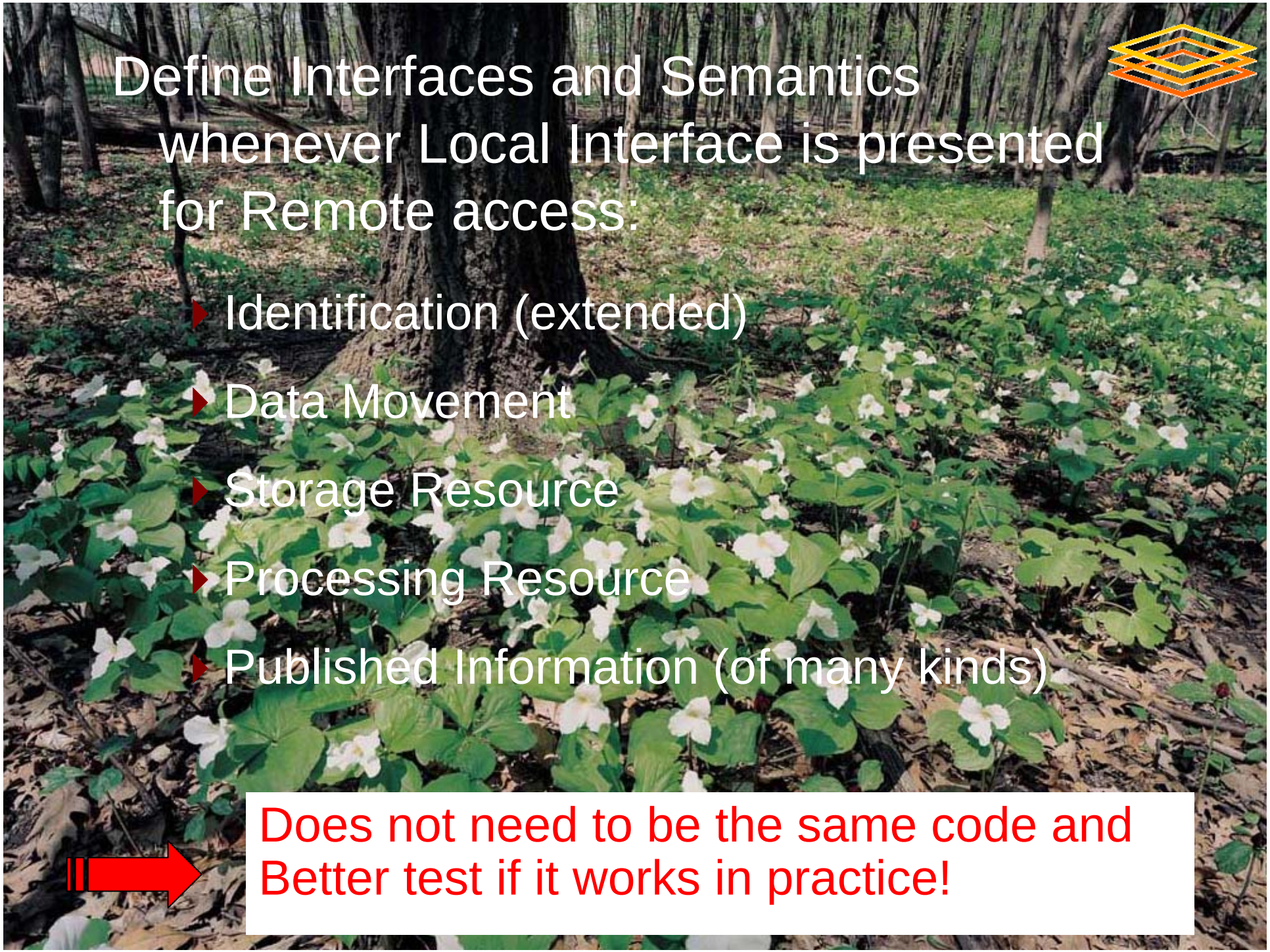
…it has also been pointed out that interoperability is often more of an **organizational issue**.

….it may be prudent for user communities or governments to take steps to encourage interoperability in various situations

… tends to be regarded as an issue for experts and its implications for daily living are sometimes underrated.

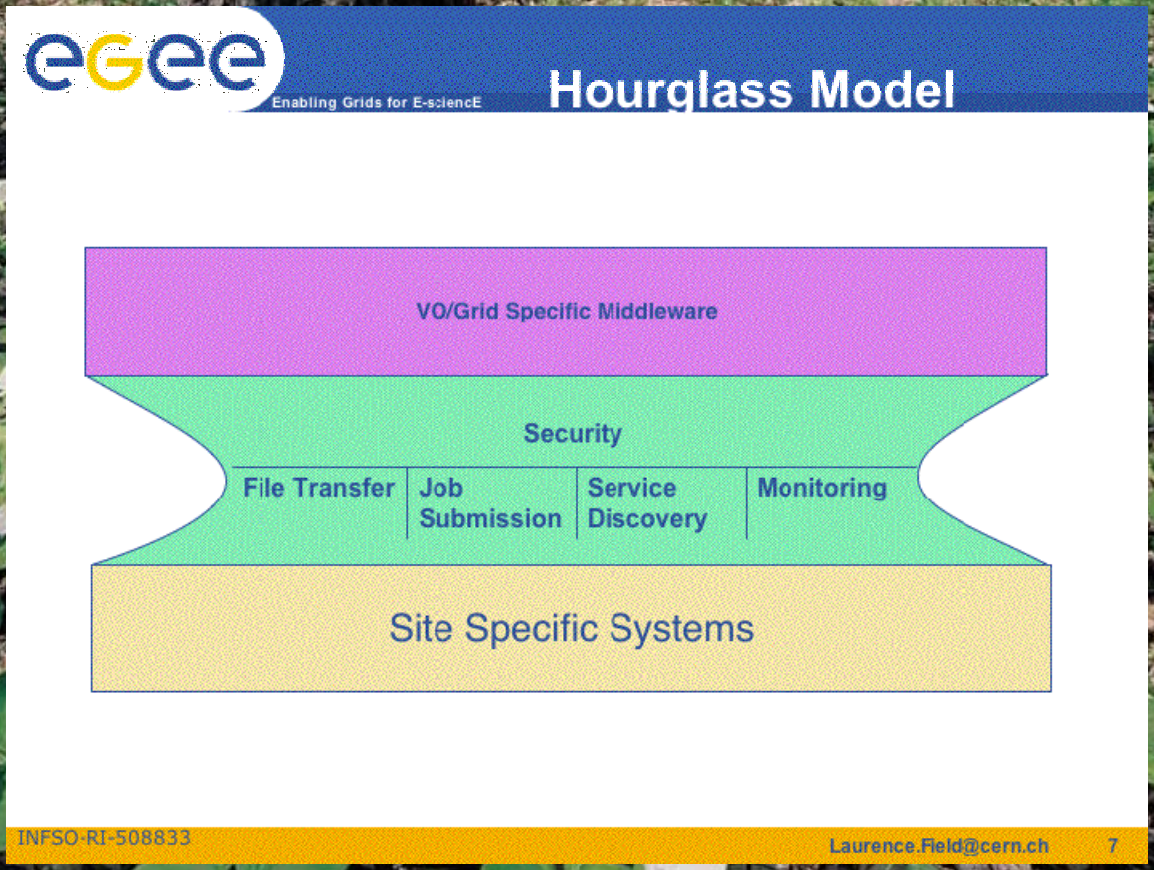
gateways


VOs
VO Services and Application Interfaces (including WLCG)
Grid and VO Services
Network Fabric
Resource Interfaces, Site Services
VO Remote Services (including WLCG)


Define Interfaces and Semantics
whenever Local Interface is presented
for Remote access:
Identification (extended)
Data Movement
Storage Resource
Processing Resource
Published Information (of many kinds)
Does not need to be the same code and
Better test if it works in practice!

Abstraction of Services

(see Laurence talk)

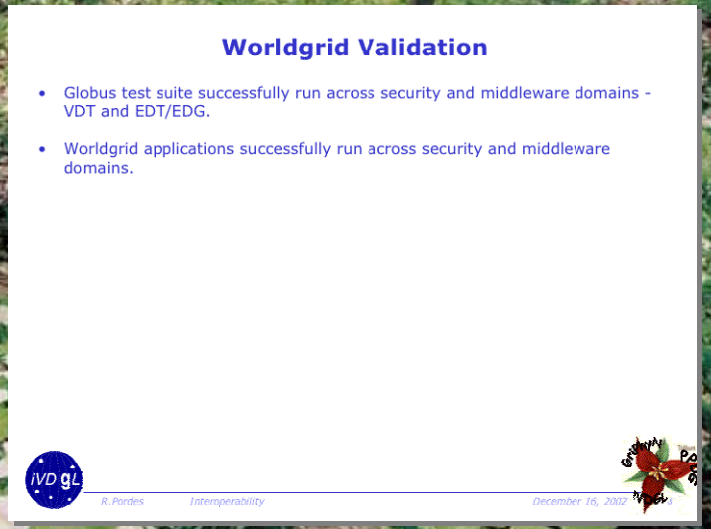


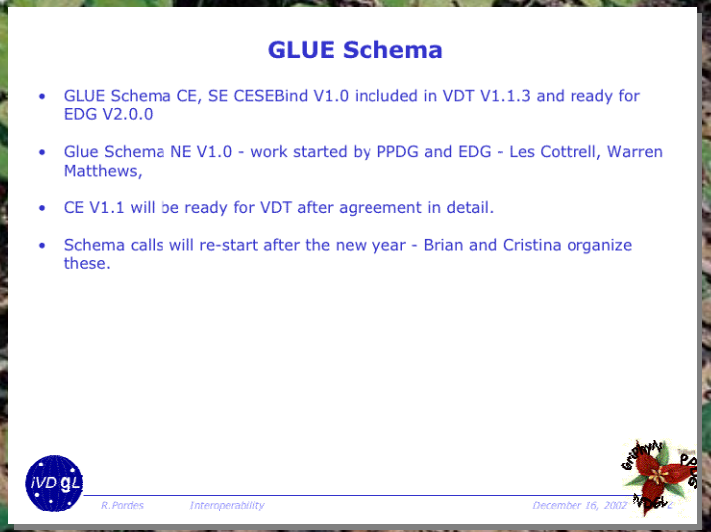
Early HEP Interoperability effort "WorldGrid" 2002

Tracking down in compatibilities in X509 authentication infrastructure.

Identified hole in middleware offerings: Information Attributes and Structure - Glue Schema".

Early LHC direct job submissions across EU and US.

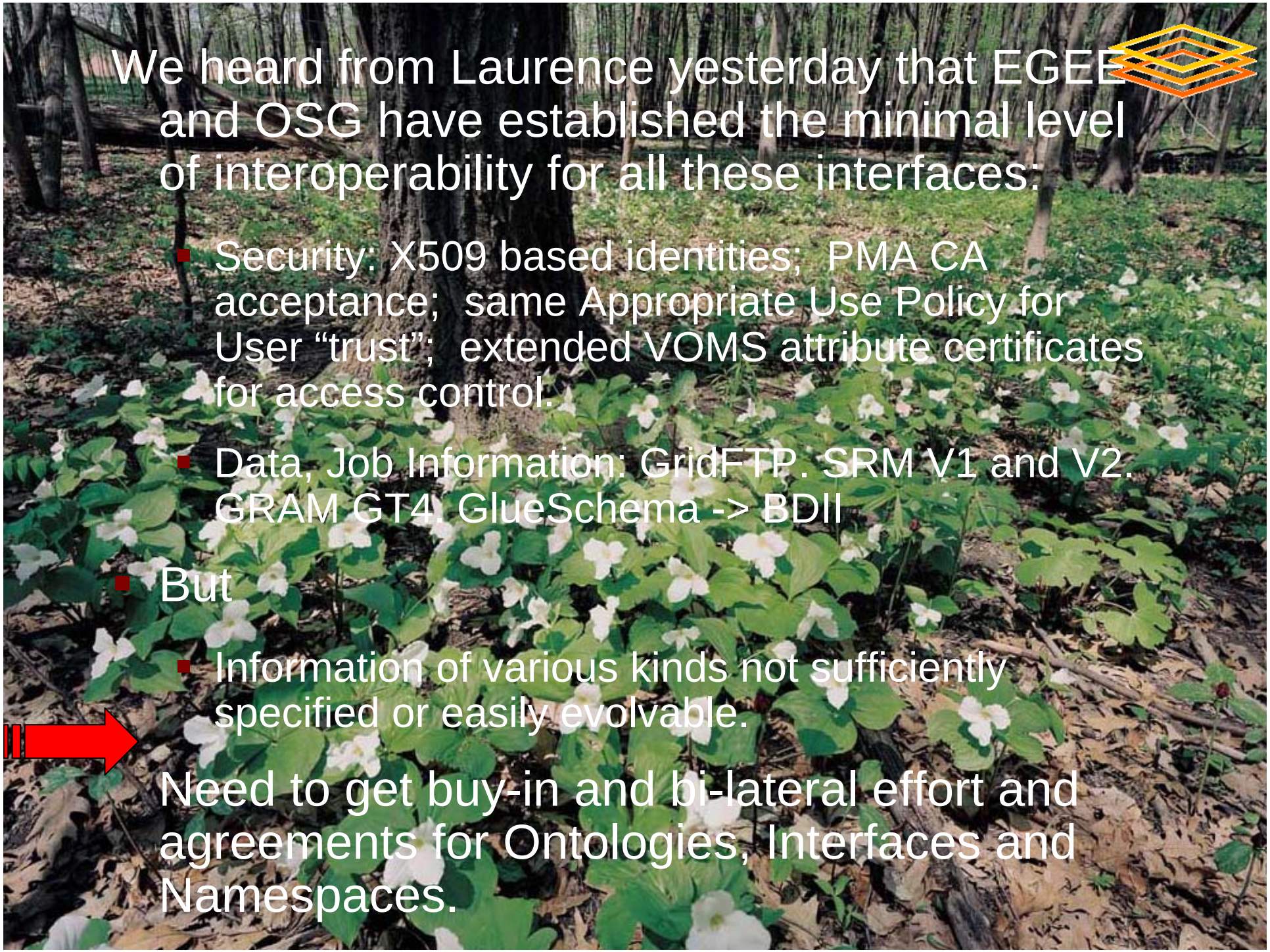




History of Common Storage Interface

- SRM V1 solidified winter 2002
- SRM V2 agreed to in summer 2004
- ~5 implementations.
- To date a success in defining and agreeing to a specification to use cases and experiment requirements..
- Brings out continuing need to have implementations, to deploy and test.

And of People To Talk to each other..



We heard from Laurence yesterday that EGEE and OSG have established the minimal level of interoperability for all these interfaces:

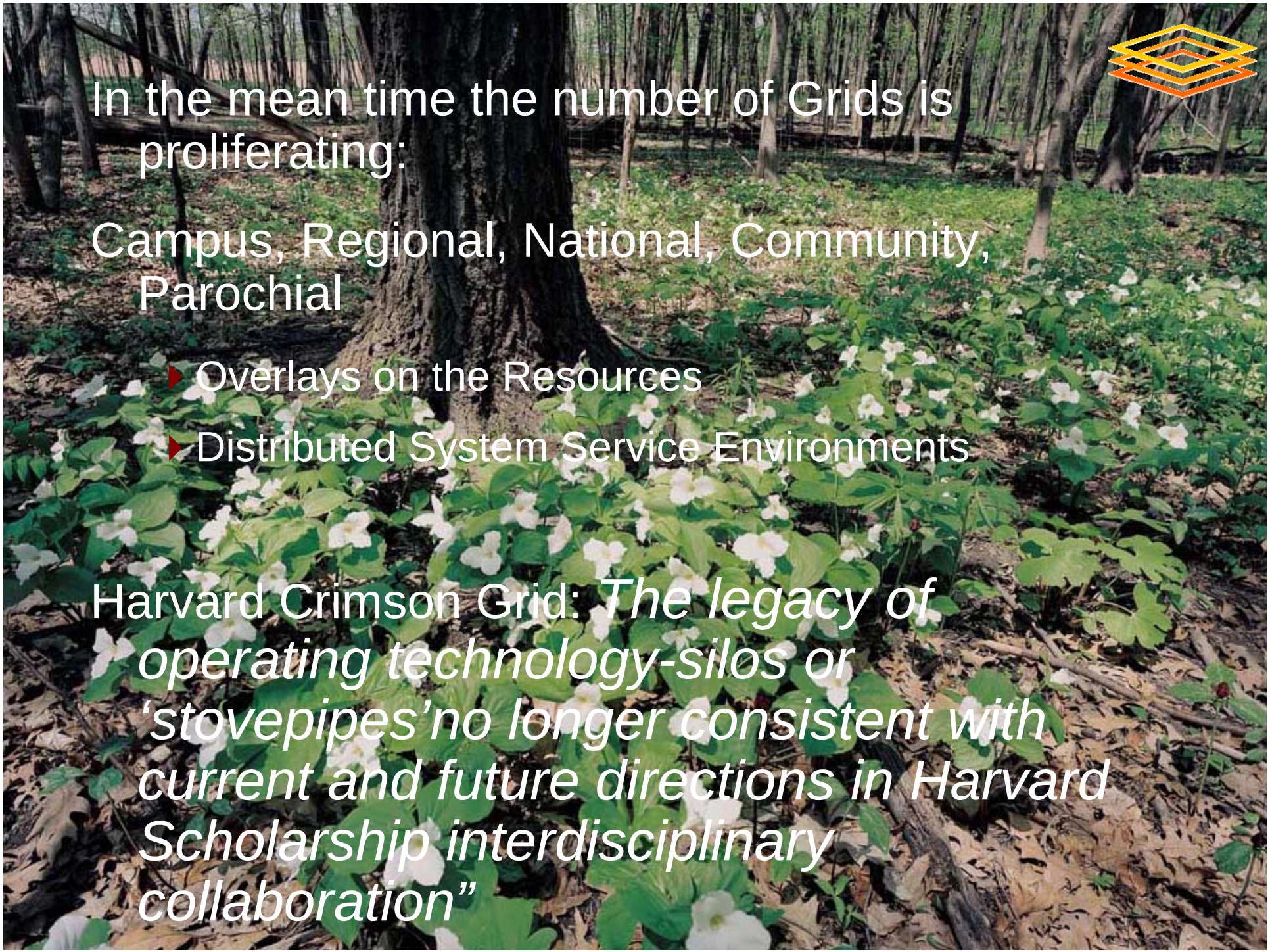
- Security: X509 based identities; PMA CA acceptance; same Appropriate Use Policy for User "trust"; extended VOMS attribute certificates for access control.
- Data, Job Information: GridFTP. SRM V1 and V2. GRAM GT4. GlueSchema -> BDII

- But
  - Information of various kinds not sufficiently specified or easily evolvable.

Need to get buy-in and bi-lateral effort and agreements for Ontologies, Interfaces and Namespaces.

Program in place to maintain Interoperability (til things get tight):

- **Software Releases** driven by common stakeholder - LHC - needs.
- **Cross-Validation with WLCG applications** at the Integration stage.
- **Virtual Data Toolkit** efforts for and extensions in common components build and testing.
- **Joint program for validation** and testing tools.
- **Cross-participation** in technical and collaboration meetings. E.g. Service Challenge, technical design and blueprint meetings.
- **Practice -** more supported X-grid VOs and applications (practical use cases).



In the mean time the number of Grids is proliferating:

Campus, Regional, National, Community, Parochial

- Overlays on the Resources
- Distributed System Service Environments

Harvard Crimson Grid: *The legacy of operating technology-silos or 'stovepipes'no longer consistent with current and future directions in Harvard Scholarship interdisciplinary collaboration"*

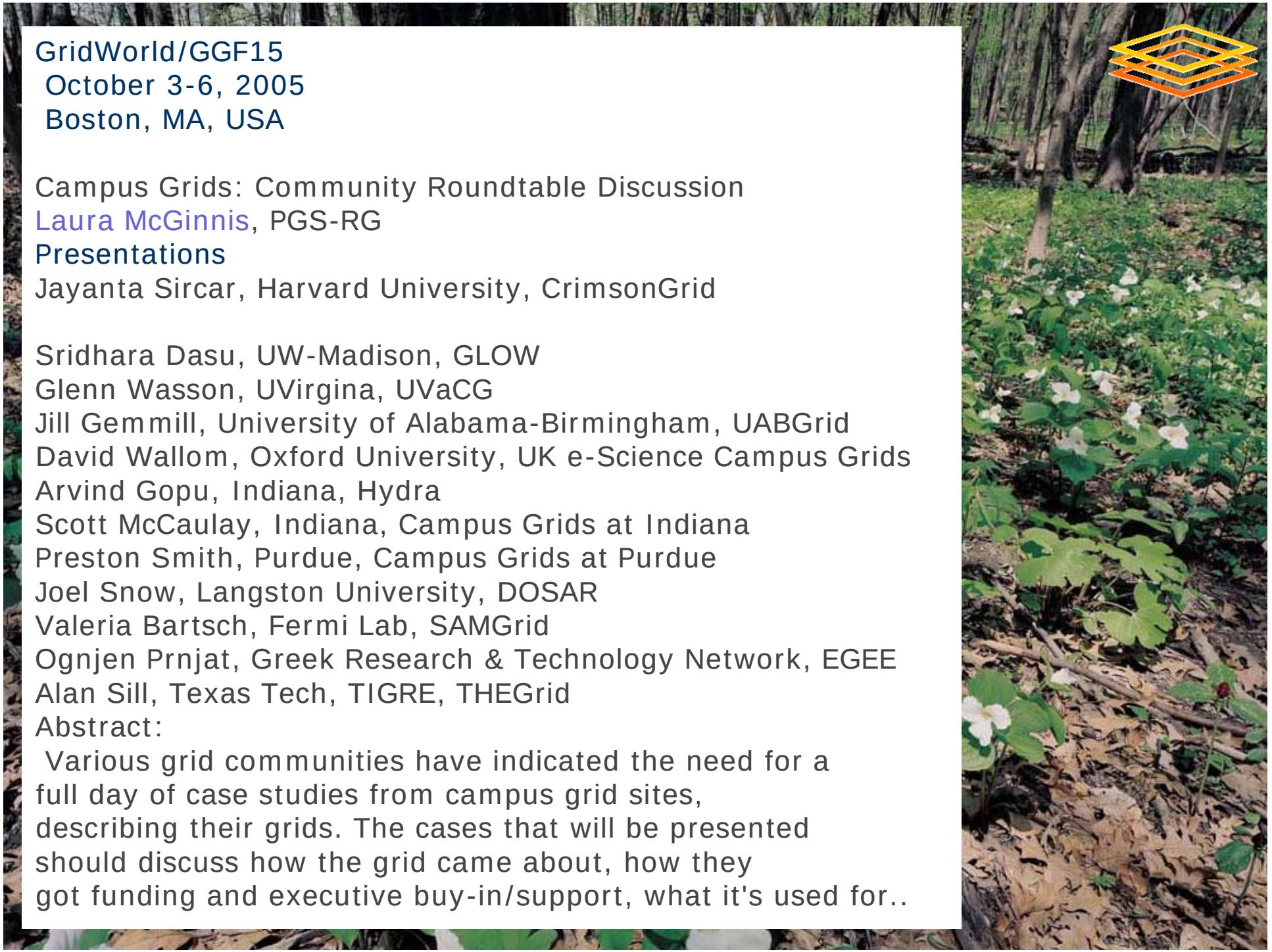
CampusGrid meeting16 June, 05 10:30 AM - 17 June, 05
e-Science Institute, 15, South College Street, Edinburgh

Organiser: Prof Paul Jeffreys

Overview of existing CampusGrid activities, determine best practice, understand security issues, explore full economic costing, outline challenges in setting up a CampusGrid, discuss how to connect with the National Grid Service, and review general methods for federation of resources.

Overview issues relating to sharing data within a CampusGrid environment, find consensus on what defines a CampusGrid (as preparation for the BOF at the All Hands Meeting); and review exciting new technologies which have potential for a second generation of CampusGrids.

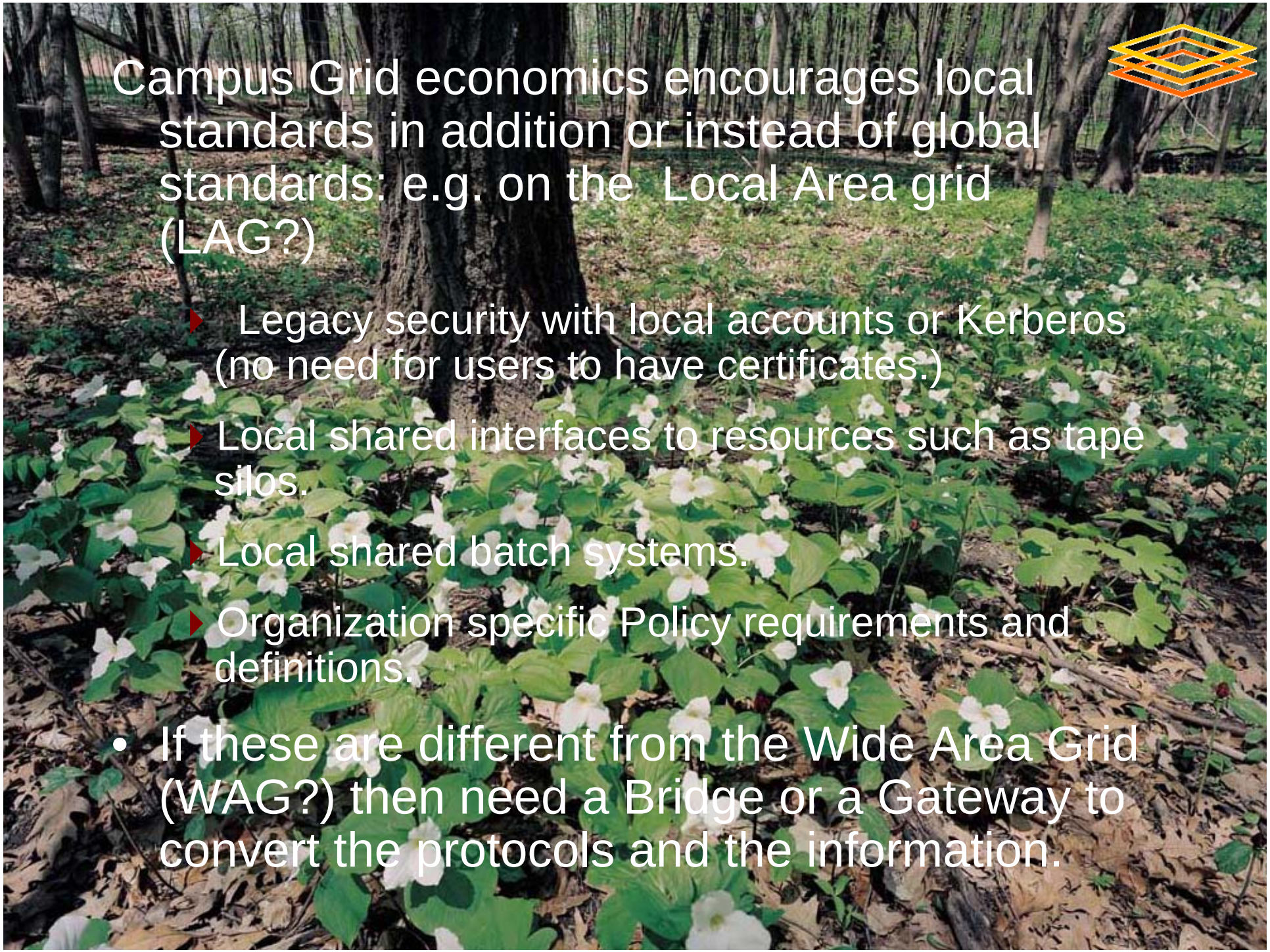
Introduction, aims, deliverables- Paul Jeffreys
Overview of Condor and Globus- John Wakelin
Review of how to deal with Firewalls within a CampusGrid environment- Bruce Beckles
Deploying Grids on Campus Networks - Andrew Cormack
Local Security issues - Bruce Beckles
Full Economic Costing on CampusGrids- Rhys Newman
Federation of Resources and building more Complex Grids- Steve Newhouse
How to Connect CampusGrids to NGS- Neil Geddes
Panel Discussion, overview of CampusGrid activities across UK, questions and answers- Facilitated by Peter Clarke
Review of dealing with data in CampusGrid environment- (tbc)
Condor and Stork- Peter Couvares
Xen- Andrew Warfield
Inferno- Jon Blower
GridMP at ISIS- Tom Griffin
Dynamic Service Deployment- Paul Watson
Virtualisation at Oxford- Rhys Newman

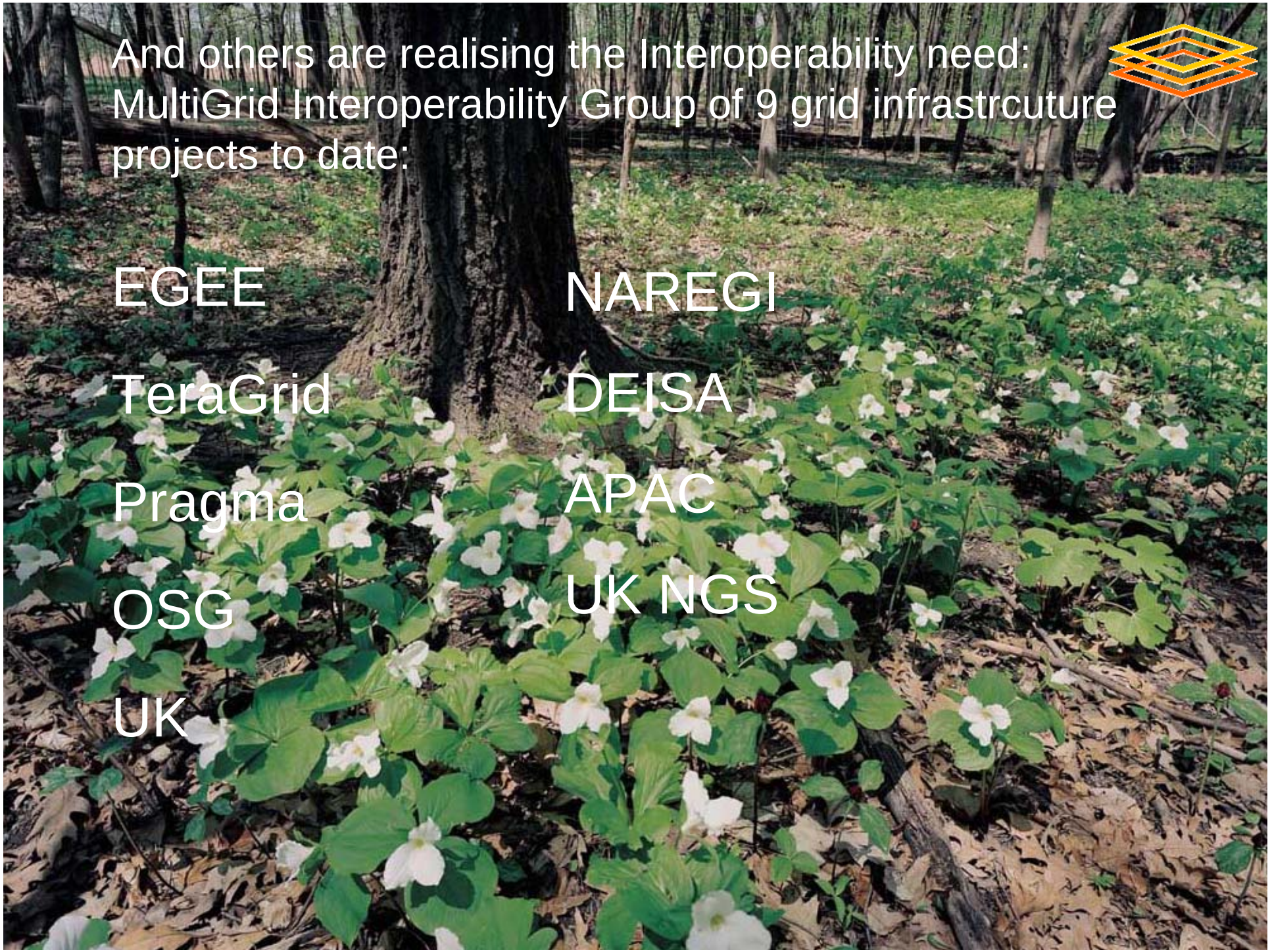


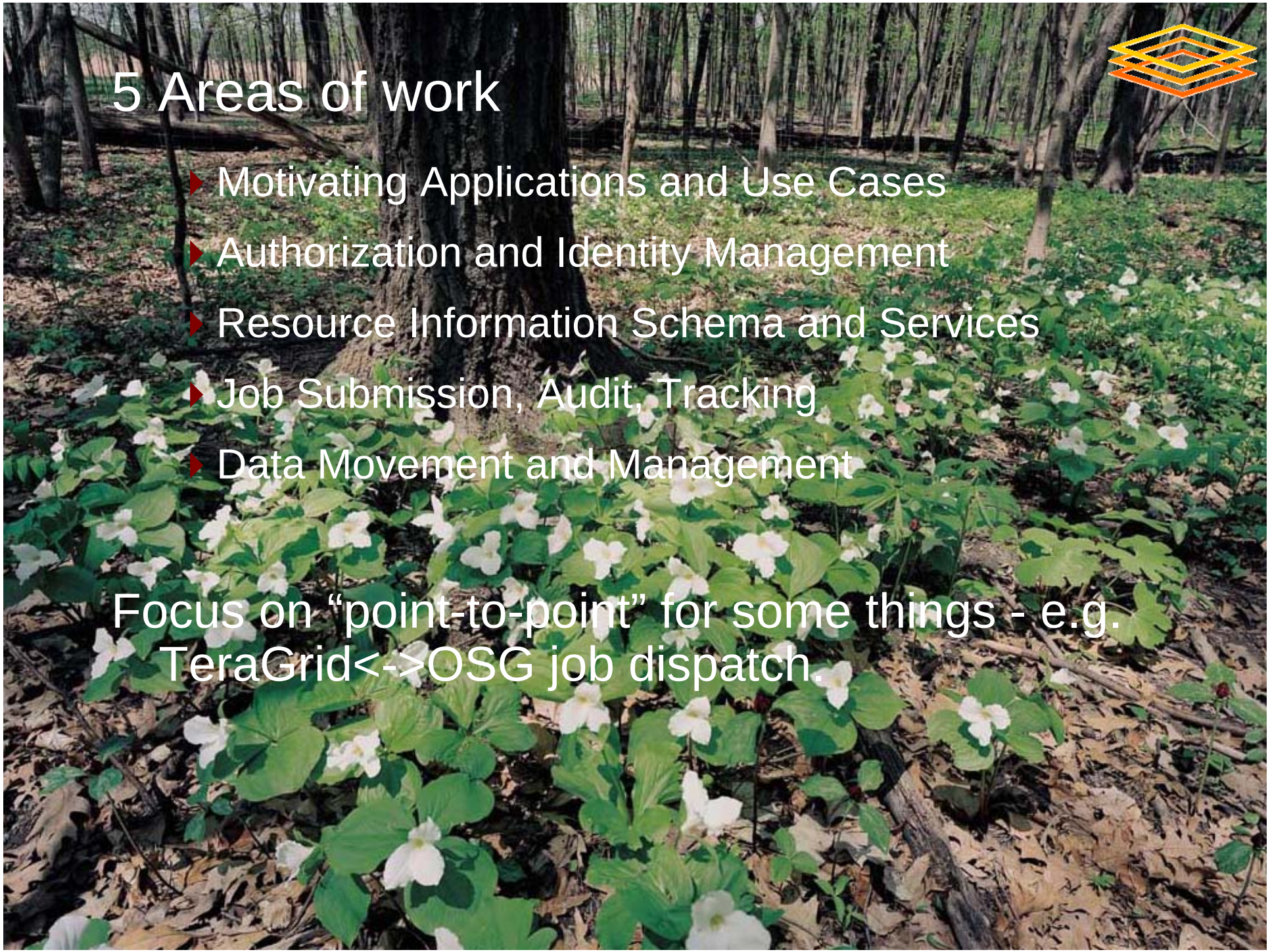
GridWorld/GGF15
October 3-6, 2005
Boston, MA, USA

Campus Grids: Community Roundtable Discussion
Laura McGinnis, PGS-RG
Presentations
Jayanta Sircar, Harvard University, CrimsonGrid

Sridhara Dasu, UW-Madison, GLOW
Glenn Wasson, UVirgina, UVaCG
Jill Gemmill, University of Alabama-Birmingham, UABGrid
David Wallom, Oxford University, UK e-Science Campus Grids
Arvind Gopu, Indiana, Hydra
Scott McCaulay, Indiana, Campus Grids at Indiana
Preston Smith, Purdue, Campus Grids at Purdue
Joel Snow, Langston University, DOSAR
Valeria Bartsch, Fermi Lab, SAMGrid
Ognjen Prnjat, Greek Research & Technology Network, EGEE
Alan Sill, Texas Tech, TIGRE, THEGrid
Abstract:
Various grid communities have indicated the need for a full day of case studies from campus grid sites, describing their grids. The cases that will be presented should discuss how the grid came about, how they got funding and executive buy-in/support, what it's used for..


Campus Grid economics encourages local standards in addition or instead of global standards: e.g. on the Local Area grid (LAG?)
Legacy security with local accounts or Kerberos (no need for users to have certificates.)
Local shared interfaces to resources such as tape silos.
Local shared batch systems.
Organization specific Policy requirements and definitions.
If these are different from the Wide Area Grid (WAG?) then need a Bridge or a Gateway to convert the protocols and the information.


And others are realising the Interoperability need:
MultiGrid Interoperability Group of 9 grid infrastrcuture projects to date:
EGEE
NAREGI
TeraGrid
DEISA
Pragma
APAC
OSG
UK NGS
UK



5 Areas of work

- Motivating Applications and Use Cases
- Authorization and Identity Management
- Resource Information Schema and Services
- Job Submission, Audit, Tracking
- Data Movement and Management

Focus on “point-to-point” for some things - e.g. TeraGrid<->OSG job dispatch.

Information ?

- **Most of the production grid projects use some form of the GLUE schema** for historical reasons - the result of a collaboration effort started in April 2002 by the EU-DataTAG and US-iVDGL projects and EGEE, LCG, OSG, Globus and NorduGrid now participating.
- It models information about site, service, cluster and storage resources associated with one another. It presents the data model that is mapping in the form of LDAP and XML schema
- it is valuable to abstract and represent broader range of entities than GLUE does.
- **CIM is an object-oriented information model defining management information about system, network, application, service** and so on with UML class diagram and textual MOF files including verbal description of each class and property.
- **OGSA-WG would side with CIM because of its extensibility, potential for wide coverage of requirements**, implementation options of manageability, reusability of existing work and expertness of DMTF for resource modeling.
- Some newer major Grid projects such as **NAREGI are adopting CIM** as the resource model to be compliant with such major industrial efforts.

Job Standard Description Language (JSDL GGF working group):

- GridSAM: Provides a plain web service that accepts compliant JSDL 1.0 which can interface into GRAM, directly to schedulers/execution environments..
- NAREGI: The jobs submission system accepts JSDL (with extensions) specified jobs that are submitted into the NAREGI super scheduler ..
- UNICORE: This will be achieved through a set of 'atomic web services' that will stage files in & out.
- Object – AJO to specify jobs invoked through a BPEL specified workflow environment.
- Globus: The introduction of JSDL into WS-GRAM has been introduced as work item but has not yet been scheduled for a specific release.
- DEISA:. A web service layer DESHL will accept JSDL specified jobs for submission into UNICORE middleware layer.
- VPAC have an implementation of a JSDL like system.
- CREAM (planned – date?)

Interest in practical interoperability at this weeks GGF in Athens

Grid Interoperation Now Charlie Catlett, USA

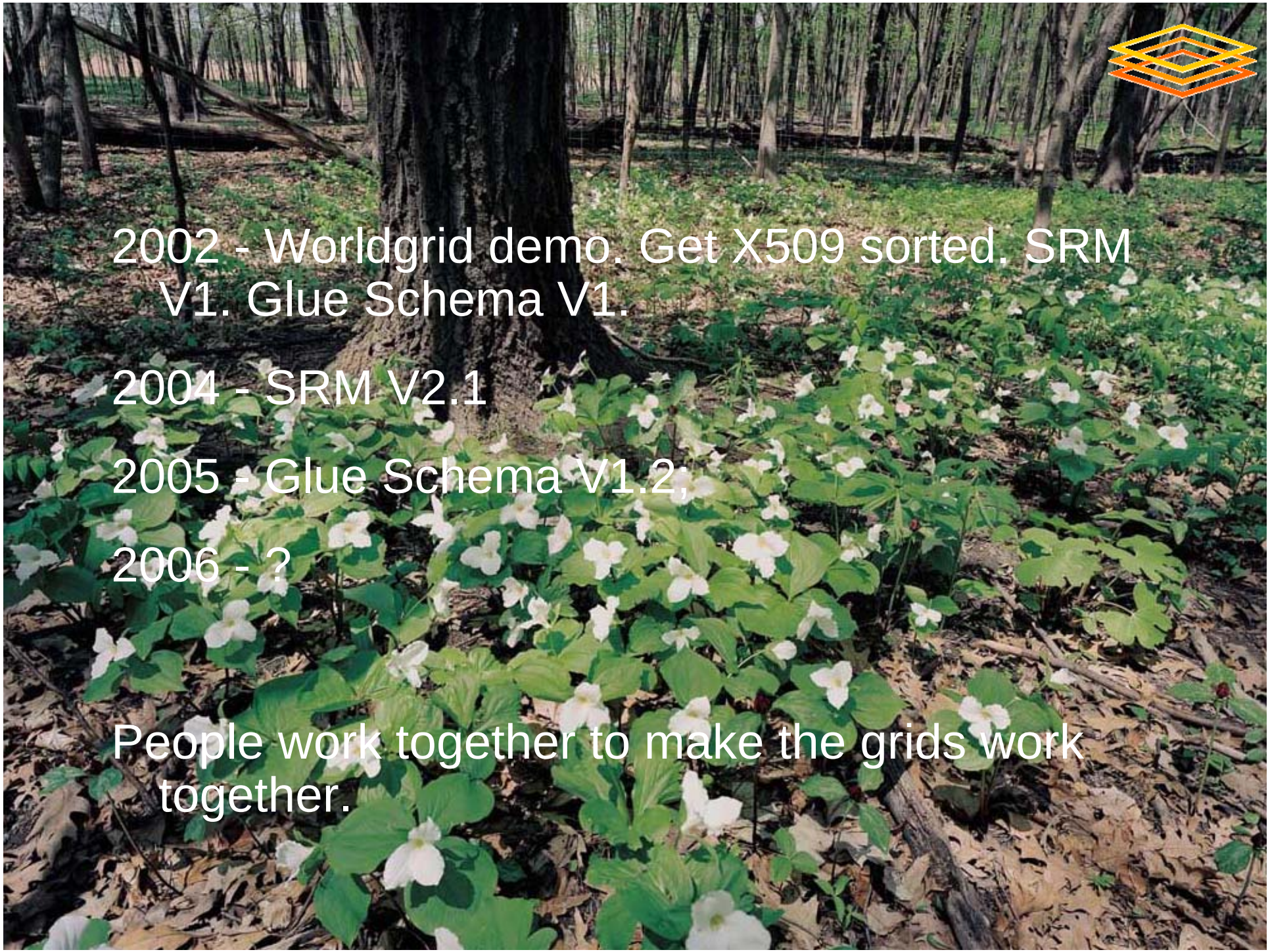
caGrid-Interoperable Infrastructure for Cancer Research
National Cancer Institute Center for Bioinformatics

Planning interoperability demonstrations at GGF17 Dejan Milojicic and Stuart Schaefer (CDDLM-WG) /\Group Discussion

OGSA ByteIO Interoperability Discussion Neil Chue Hong, Mark Morgan (BYTEIO-WG) /\Group Discussion

Interoperability Fests Stephen Pickles and Franco Travostino (Interoperability Fests) /\Ad-hoc BOF


http://www.grid-interoperability.org/



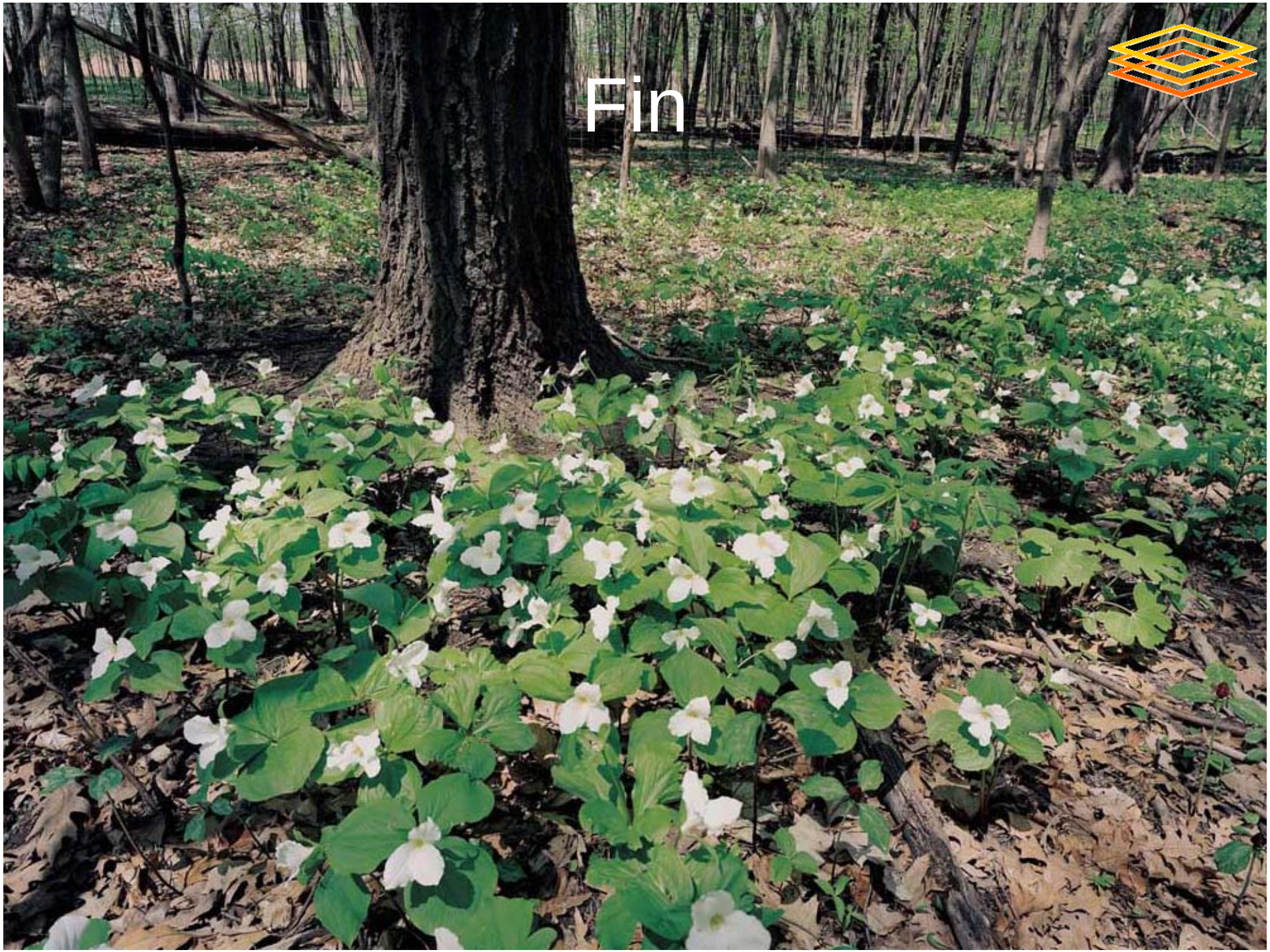
2002 - Worldgrid demo. Get X509 sorted. SRM V1. Glue Schema V1.

2004 - SRM V2.1

2005 - Glue Schema V1.2;

2006 - ?

People work together to make the grids work together.


Fin