

## Galatea Information Strategies presents:

### Building an OSS-based Enterprise

June 8, 2005

#### Day 1

#### **Presentation: The OSS Landscape**

- The state of OSS
- OSS: Childhood
- OSS: Adolescence
- OSS: Young adulthood
- OSS: Maturity?
- Some challenges
- Some more challenges

#### **Presentation: A typical open source pilot**

- Example: web application
- Example: web application: data
- Example: web application: security
- Example: web application: development
- Example: web application: integration
- Example: web application: the problems

#### **Presentation: Addressing the challenges**

- The typical problems

- Technology problems
- Process problems
- Choice problems

## **Presentation: Developing a successful pilot**

- Principles
- Starting a web pilot right
- Authentication and security
- Development processes
- Production processes

## **Presentation: Developing a successful implementation strategy**

- Steps
- Understand the pitfalls
- Understand the pitfalls
- Organizing your choices
- Example: enterprise components
- Example: More enterprise components
- Other components
- Implement

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## Day: 1

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## Presentation: The OSS Landscape

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## The state of OSS

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- Over the past 4/5 years, OSS has gone from youth to adolescence
  - OSS is now a viable choice for large-scale organizations
  - OSS is common talk in news and business
  - Recent report from CSC on enterprise usages of OSS:
    - 70% have Linux and/or Apache
    - 42% are using Tomcat
    - 14% are using PHP
    - 10% are using JBoss
    - 10% are using Struts
  - More than ever, there is a compelling business case for organizations to move to OSS
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## OSS: Childhood

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- Open source was born of the hacker culture of the 70s (and earlier)
  - Richard Stallman and GNU dominated open source in the 80s and early 90s
  - Open source represented several things:
    - counter-cultural movement
    - anti-monopolistic movement
    - individual enterprise
    - freedom to innovate, share, use
    - freedom to share freely or charge as appropriate
  - Open source was not yet a threat to the mainstream
  - Open source == free software
- 

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## OSS: Adolescence

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- Like a teenager, open source went a bit crazy in the late 90s
  - The Big Split: open source redefined as a methodology instead of a culture
  - Eric Raymond, Netscape and the launch of "commercial" open source
  - Open source != free software
  - Open source + the Internet = Linux which leads to popular access to open source
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## OSS: Young adulthood

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- Explosion of choices: four years ago you might have one or two choices for a technology; now you have many more:
    - OSSes: RedHat (Fedora), Mandrake, FreeBSD, OpenBSD, Slackware, Debian, SuSE (and dozens of lesser-known ones)
    - Servlet Containers: Tomcat, Jetty, Resin, Orion
    - Technologies: Java, PHP, Perl, Python, .NET, C#
    - Web frameworks: Cocoon, Struts, Espresso, Maverick, Turbine, JSF, Tapestry, Avalon, Dinamica
    - freshmeat.net has info on 34k projects
    - sourceforge.net has 86k registered projects
  - Explosion of licenses
  - Explosion of technological advances:
    - Web services: RSS, SOAP, XML, XOP, WSDL, XMLP, WML, IRC, portals
    - Java: JTA, JAXP, JAF, JMS, JSF, JAAS, RMI-IIOP, JDO
    - Development technologies: compilers, testers, linkers, IDEs
  - Explosion of adoption:
    - Open source becomes a key component of major hardware/software vendor strategies
    - Open source becomes a component of enterprises in Fortune 500 companies
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## OSS: Maturity?

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- Open source faces a crisis of maturity:
    - Does it achieve the ideals of its origins and stay as a separate force in the technology world?
    - Does it get subsumed by the increasing trend of corporate open source?
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## Some challenges

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- As OSS matures, there are challenges that face OSS implementors, particularly those in advocacy/evangelization roles
  - OSS is not without its own pitfalls - remember, OSS IS NO PANACEA
  - Some inherent problems:
    - Version mania: constant upgrades is becoming a hallmark of OSS software:
      - Apache/Tomcat release times 2-4 weeks
      - Apache 1.3 branch went to .31 in 6 years
      - Apache 2.0 branch went to .52 in 4 years
    - Project sustainability: which projects will survive?
    - When is free really free?
    - Corporate open source: proprietary software disguised?
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## Some more challenges

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- Overwhelming choices:
    - How to choose a language direction? Java? Perl? C#? Python? C++?
    - How to choose a direction within a language? Java 1.4 or 1.5?
    - How to choose a technology direction? J2EE or just part of it?
    - How to pick a winning technology? JBoss vs OpenEJB vs JoNAS vs Geronimo?
  - Technology competition and breakneck development can obfuscate the big picture
  - New technology is NOT always the answer
  - OSS choices must be made within the scope of two things:
    - Knowing what the technology is for
    - Knowing how to use the technology effectively
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## Presentation: A typical open source pilot

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## Example: web application

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- Take a \$500 PC, put the latest Fedora Core distro on it and hook it up to the net
  - Get the latest Apache
  - Get the latest Tomcat
  - Take the defaults
  - Comb the net for Apache-Tomcat connectivity - spend hours getting it to work
  - Start adding/editing files in \$APACHE\_HOME/htdocs and \$CATALINA\_HOME/webapps
  - View the website via your browser
  - Tell your boss
  - ... anything wrong with this?
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## Example: web application: data

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- Ooops, we need data
  - Install MySQL
  - Create tables/load them
  - Create database connection in the app(s)
  - ... and what's wrong here?
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## Example: web application: security

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- Oops, we need security
  - Edit tomcat-users.xml and add roles/users
  - Create brand new userids/passwords
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## Example: web application: development

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- Now we need a bit more
  - Separate development to a separate machine
  - Optionally, have a QA machine or web server
  - But what about processes?
    - What kind of development environment should we have? CVS/Subverion? Ant/Maven? How organize it?
    - How to move applications to qa and then to production? FTP? SSH? NFS drive?
    - What standards should be used? Are there corporate ones? Can they be updated?
  - And then there's more ...
    - Version of Java? Do we need 1.5?
    - Integration with other existing web applications or application pieces? (Perl, PHP, cgi-bin)
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## Example: web application: integration

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- Now our application has the attention of some managers
  - Now they have 'suggestions':
    - Allow separate logins for employees?
    - Integration with legacy applications?
    - Content management?
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## Example: web application: the problems

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- The problem of defaults
  - The problem of versions
  - The problem of installation directories
  - The problem of point-of-failure
  - The problem of (lack of) standards
  - The problem of backups
  - The problem of documentation
  - The problem of security
  - Bottom line: **is this pilot a valid and responsible way to introduce OSS to the enterprise?**
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## Presentation: Addressing the challenges

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## The typical problems

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- The first step towards successful open source is organizing the problems or "challenges"
    - "Use of technology" problems
    - Process problems
    - Choice problems
  - OSS has the strange effect of highlighting inherent problems in your enterprise or information technology strategy
  - But, these problems can all be remedied with the right approach
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## Technology problems

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- Technologies come and go but the core business stays the same
  - What is important is that you know how to use what you choose
  - Common information technology mistakes:
    - The latest and greatest
    - Bleeding edge software
    - Technology for the sake of technology, instead of for the business
  - Sounds obvious, but you must always start with one question: what is the purpose of IT? **IT is the computing infrastructure that supports or enhances the mission of the organization.** Or:
    - IT is a tool
    - IT must be aligned with business goals
    - IT should be subjected to the same rigors as a manufacturing process & tools
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## Process problems

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- OSS highlights already existing process problems for several reasons:
    - OSS is very accessible
    - OSS tends towards permutations in options and versions
    - There is less work done in the way of best practices than we need
  - You need a solid infrastructure - processes and principles - to handle the problems with OSS and to insure complete success with it
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## Choice problems

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- Factors influencing choices:
    - Technology direction
    - Project viability and health
    - Knowledge base
    - License type
    - Corporate sponsorship
    - "Spirit"
    -
  - There is no such thing as the right technology choice:  
**You can create the same application many, many different ways - none is more valid than another**
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## Presentation: Developing a successful pilot

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- Principles
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## Principles

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- Your pilot is the most critical step in OSS implementation
  - Your pilot must demonstrate:
    - Sound and viable technology choices
    - Solid processes and principles
    - Vertical slice of functionality
    - Scalability
    - Security
  - Avoid the temptation to show off! Being cool is not being smart
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## Starting a web pilot right

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- Research the options:
  - Which version of Apache/Tomcat/MySQL is the most stable?
  - What bugs are being reported on the users mailing lists?
  - What is the proven integration solution?
  - What are the security "best practices"?
  - Are there license concerns?
  - Are there documentation concerns?
- Plan, plan, plan:
  - Organize your directories for repeatability, easy of maintenance
  - Separate program directories from development directories from deployment directories
  - Document all configurables, installation quirks, directory locations
  - Define a solid and repeatable build process
  - Never take all the defaults! determine what to change
- Implement:

```
/home/pilot/apps/apache  
/home/pilot/apps/tomcat  
/home/pilot/apps/mysql  
/home/pilot/devel/app1  
/home/pilot/devel/app1/conf  
/home/pilot/devel/app1/sql  
/home/pilot/devel/app1/src  
/home/pilot/devel/app1/web
```

```
/home/pilot/deploy/myhost.com/apps  
/home/pilot/deploy/myhost.com/conf  
/home/pilot/deploy/myhost.com/logs
```

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## Authentication and security

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- Problem: multiple logins is the curse of the modern enterprise - don't reinvent!
- A solution:
  - Investigate JAAS options for hooking Tomcat authentication up to existing authentication scheme: LDAP, Kerberos, OS
  - Use LDAP server whenever possible - if you don't have one, set up OpenLDAP (with replication and TSL/SASL)
  - Kerberos is a good option if you are starting out: a bit of work, but worth it
  - If you plan on having multiple sites/applications, consider single-signon options
- Problem: OSS is not inherently more secure than anything else!
- A solution:
  - Research for the most low-risk products
  - Keep current with cert.org, sans.org and the project bug lists/security announcements
  - Subscribe to all relevant mailing lists
  - Make security your top priority: remember, you are facing both mis-information as well as real risks

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## Development processes

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- Problem: need a development process for OSS-based applications
  - A solution:
    - Use CVS with replication (CVSUP)
    - Use Ant with a well-documentation target/properties schema for builds
    - Implement a three-stage process, of development, QA and production
    - Create a simple process for tracking application releases and enabling rollbacks
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## Production processes

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- Problem: need a platform for high usage web applications
  - A solution:
    - Get more \$500 machines and put Linux on them
    - Cluster Apache with mod\_backhand
    - Cluster Tomcat with mod\_jk
    - Replicate MySQL databases
    - Enable session replication in a database
    - Have the website resolve to the cluster
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## Presentation: Developing a successful implementation strategy

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- Steps
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  - Understand the pitfalls
  - Organizing your choices
  - Example: enterprise components
  - Example: More enterprise components
  - Other components
  - Implement
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## Steps

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- All the principles of a well-defined and well-executed pilot transfer to the big picture
  - The steps are basically the same:
    1. Understand the pitfalls
    2. Organize your options
    3. Implement in a staged fashion
- 

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## Understand the pitfalls

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- Version mania and product instability:
    - Establish your own release criteria and testing plans
    - Always upgrade with a rollback plan
    - Once you find stability, keep it!
  - Lack of product infrastructure
    - Great products are useless without the proper infrastructure:
      - premier documentation
      - training services
      - tiered support services
      - integration services
      - security alerts
      - intuitive administration and operator interfaces
      - interoperability testing
      - load testing
      - release criteria
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## Understand the pitfalls

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- "Free" software is not really free - THERE WILL BE COSTS:
    - Training
    - Consulting
    - Hardware
    - Support
  - Flavor-of-the-month technologies
    - Ask the hard questions about any technology
    - Jumping on bandwagon for its own sake will be expensive
    - Older proven technologies are often better, though less sexy
  - Corporate open source and branded technologies
    - Beware brand names backed by VC funding - they could end up monopolies
    - Beware of technologies dominated by a single entity
  - Open source or "free" software requires the same approach and dedication as does commercial software:
    - Support infrastructure
    - Training, documentation, support
    - Sound implementation, upgrade, support processes
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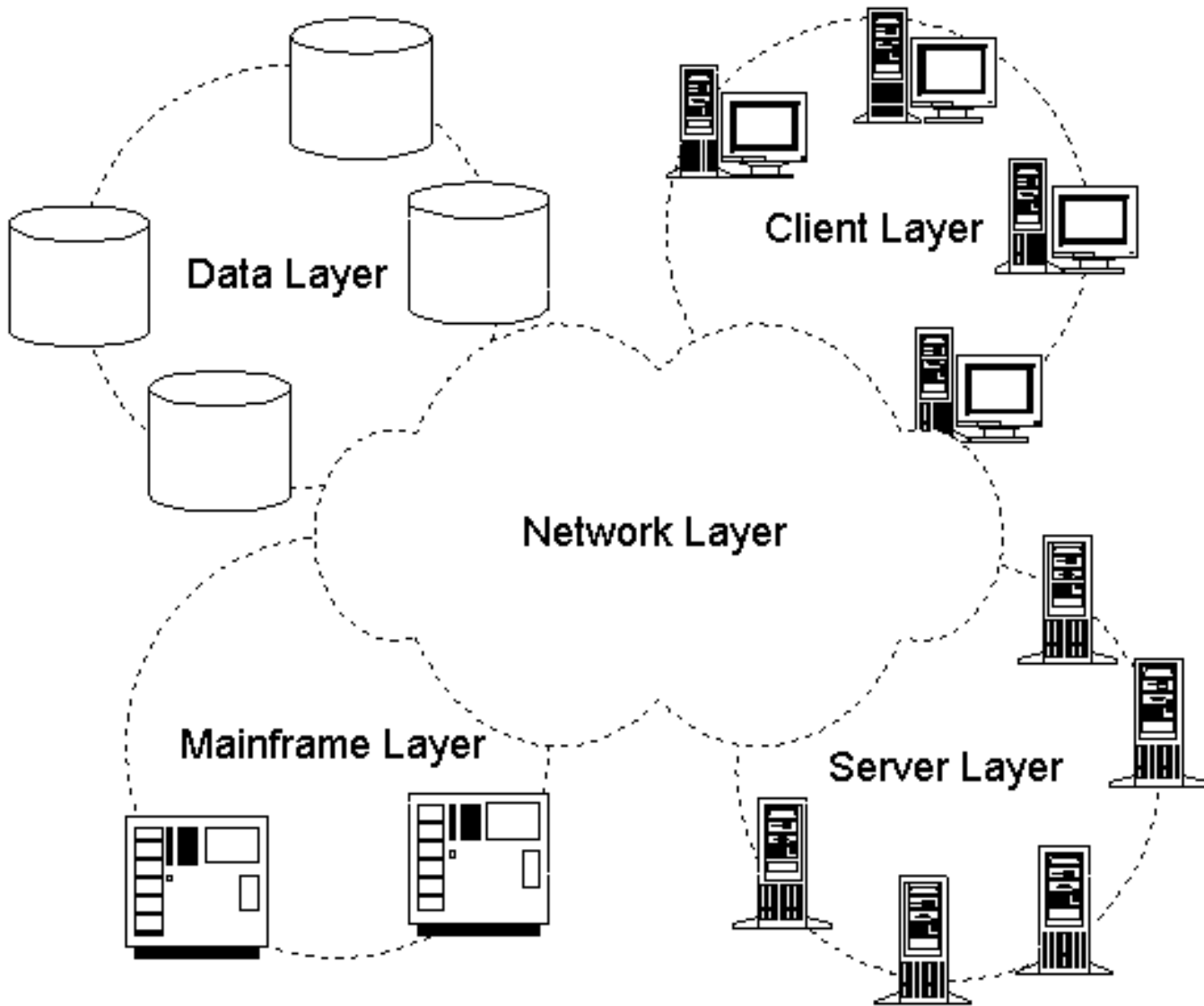
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## Organizing your choices

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## Example: enterprise components

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- Operating system
    - RedHat/Fedora
    - SuSE
    - FreeBSD, OpenBSD
    - Mandrake
  - Data
    - MySQL (note the license)
    - PostgreSQL (note replication, Red Hat DB)
    - MaxDB (i.e. SAPDB)
    - dbXML, Xindice, eXist
    - Castor, Hibernate for Java-DB mapping
  - Security
    - Kerberos components
    - OpenLDAP
    - Cryptography (PGP)
    - Single signon
    - OpenSSL
    - Monitoring programs
    - Firewall components
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## Example: More enterprise components

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- Web services
    - Apache SOAP/AXIS
    - Tomcat, Jetty
    - JBoss, JOnAS, OpenEJB, Resin, Geronimo, LUKAS
    - ebXML, Jabber, SIM, CryptIM, Magpie (PHP RSS), Jena, ircd
    - OpenCMS
  - Integration
    - JMS: OpenJMS, SwiftMQ
    - EAI: OpenEAI, Proteus, Tambora, OpenAdaptor
    - ETL: Octopus, BabelDoc, XPipe
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## Other components

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### End-user applications:

- Browser: Firefox
  - Email: Thunderbird, Chandler
  - Office package: OpenOffice
  - Communications: Mozilla, Jabber, RSS, IRC
  - Business apps: SugarCRM, OpenCRM, OFBiz
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## Implement

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- Once you have organized your choices, divide and conquer
  - Determine what you will keep commercial: mainframe apps? high-end database platform?
  - Take one slice at a time: database, communications, server platforms, end-user platforms, web services, networking, etc.
  - Be careful of tightly integrated components
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## **New section for Day 1**

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