



Web 2.0 and SOA for Learning

Robert Sherratt
Head of Systems Integration

Steve Jeyes
Pearson Edexcel



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Agenda

- SOA and Web 2.0
- AJAX
- Web 2.0 for eLearning
- Reflection



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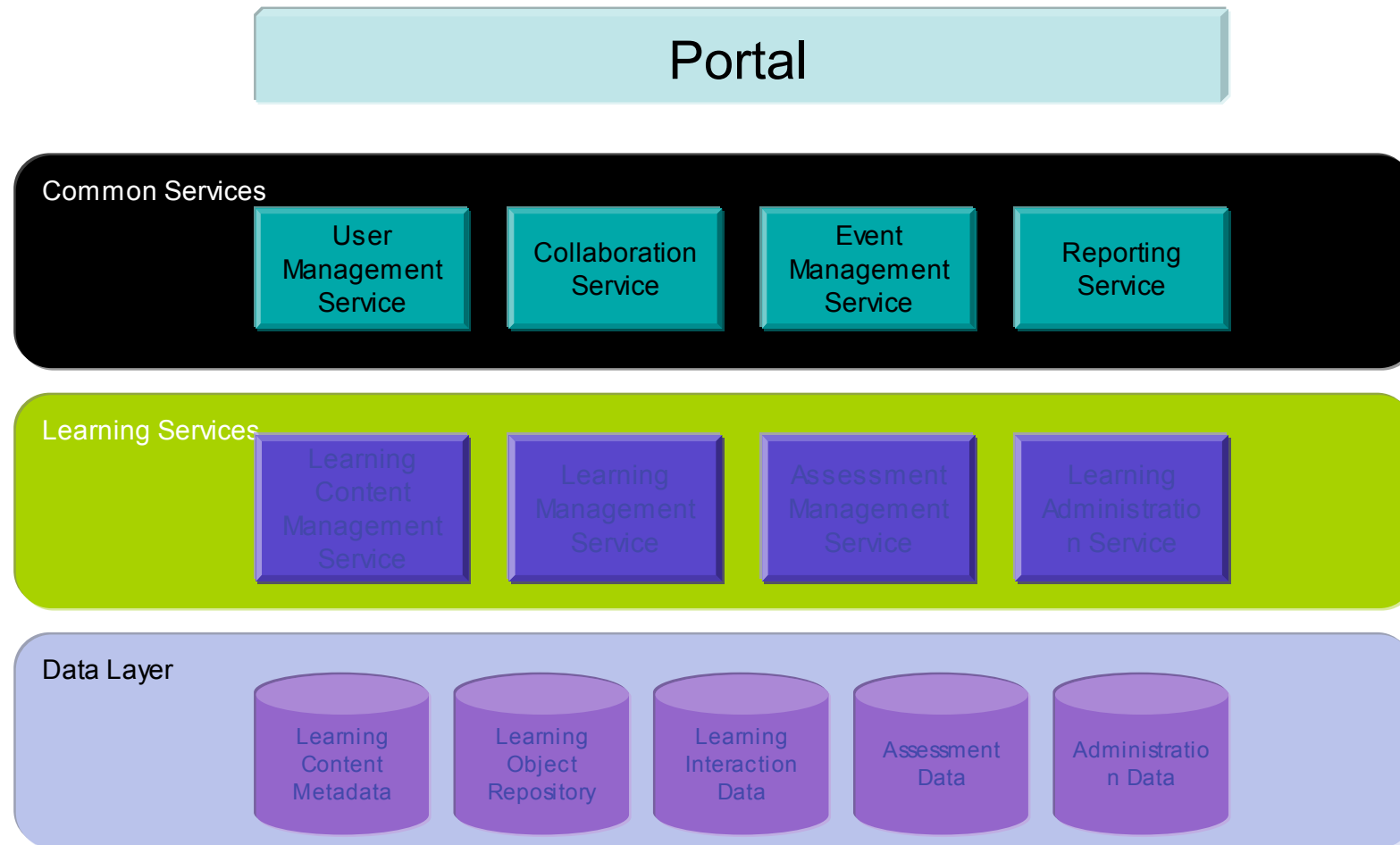


Service Oriented Architecture

- Services are components
 - Well defined interfaces
 - Implementation independent
- Self-contained and loosely coupled
- Composite services can be assembled from individual services
- Using WS and SOAP



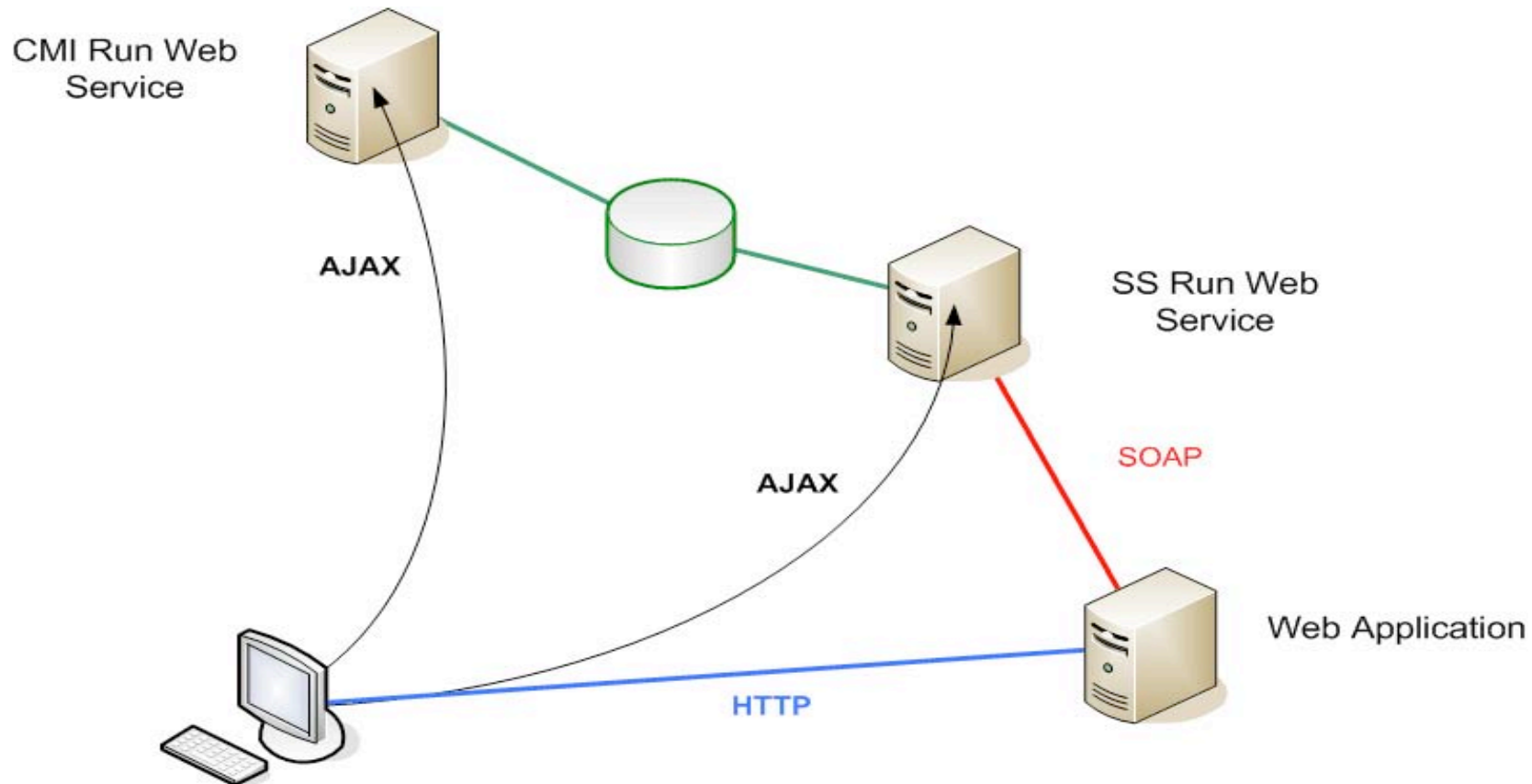
Sun eLearning architecture



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Technical Overview



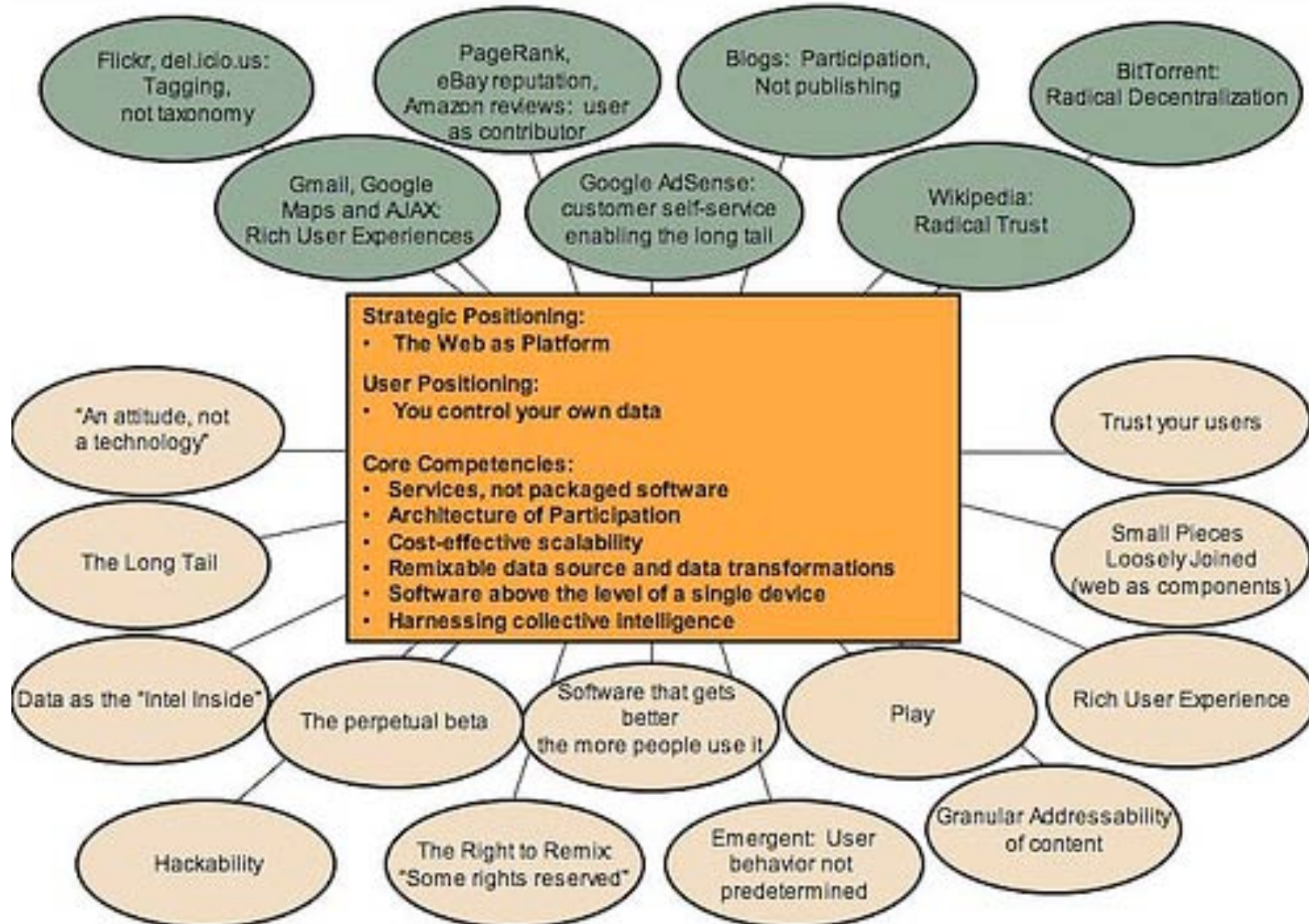




www.brantacan.co.uk for these and many more great bridges



Web 2.0 Meme Map



From O'Reilly

<http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html>

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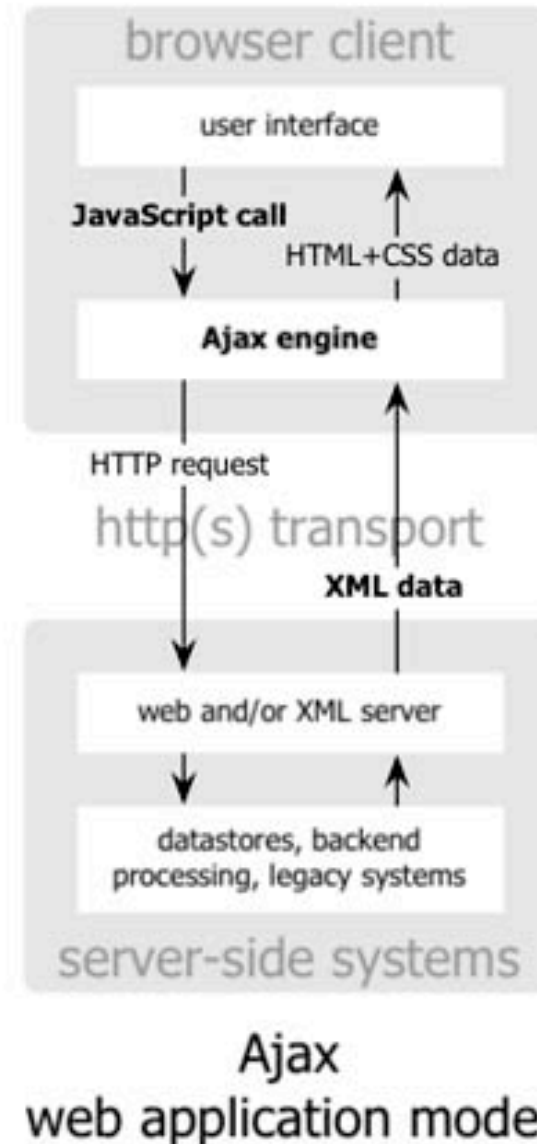
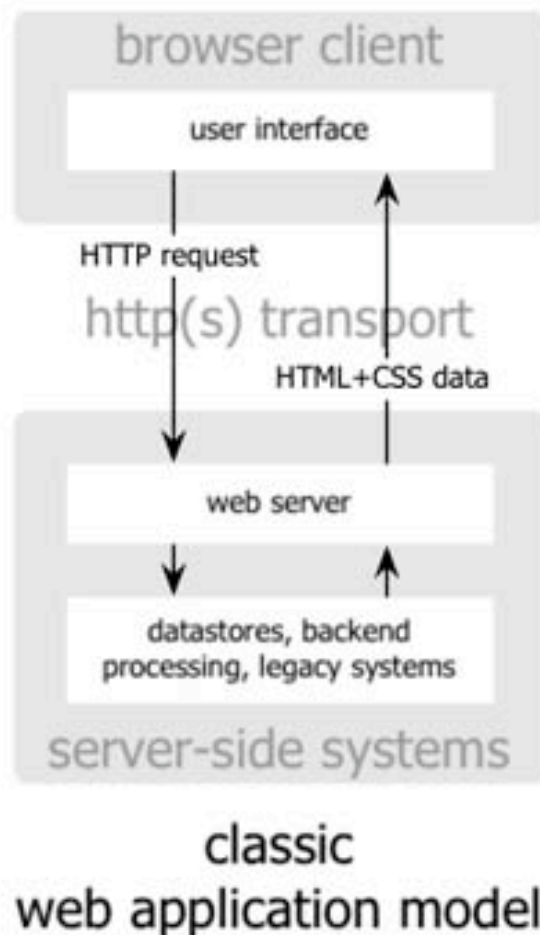


What is Ajax?

- From Jesse James Garrett's paper "Ajax: A new Approach to Web Applications"
 - <http://www.adaptivepath.com/publications/essays/archives/000385.php>
- AJAX is a group of technologies
- XHTML and CSS give standards based presentation
- Dynamic display and interaction using the DOM
- Data interchange and manipulation using XML and XSLT
- Asynchronous data retrieval using XMLHttpRequest and Javascript binding it all together



What does AJAX enable?



AJAX example I

Activity Scrolling in a mapping website

Old Style Click on a right arrow to refresh whole page

AJAX Drag map area to the right
--and watch the map scroll,
like [Google Maps](#)



AJAX example 2

Activity

Interacting in online forum

Old Style

Type message, click Submit,
regularly click "check new messages"

AJAX

Type messages, and wait as new replies
appear automatically
without needing your interaction



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AJAX example 3

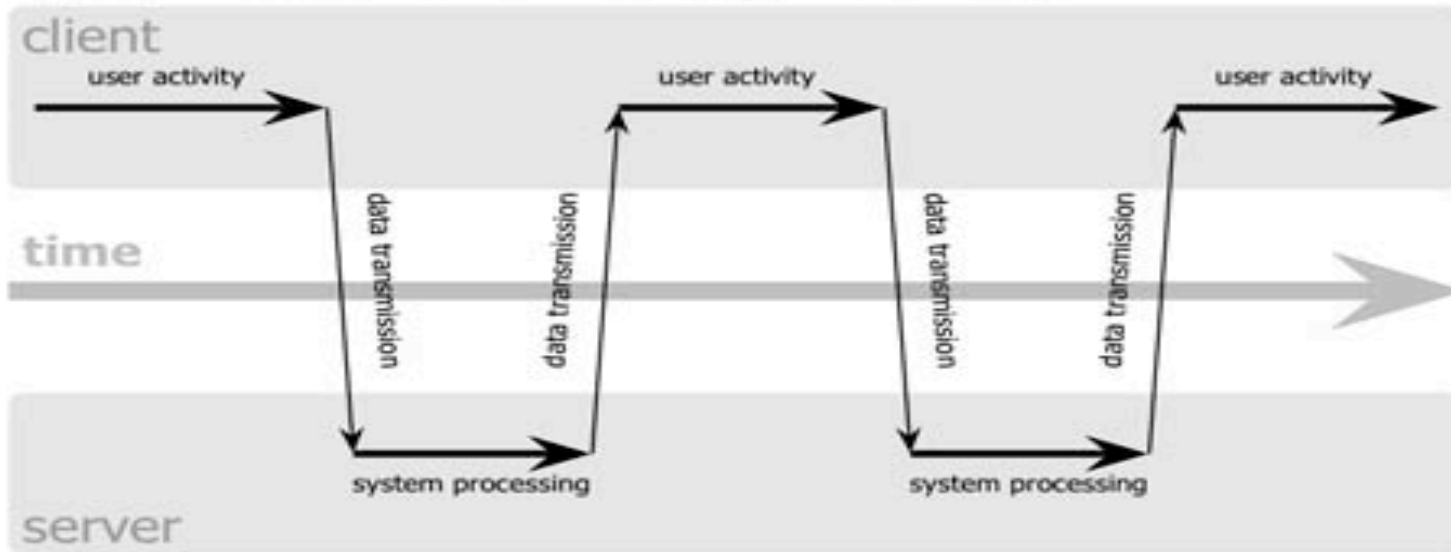
Activity Looking up a word in a dictionary

Old Style Enter the word, and click Submit to see a definition for that word

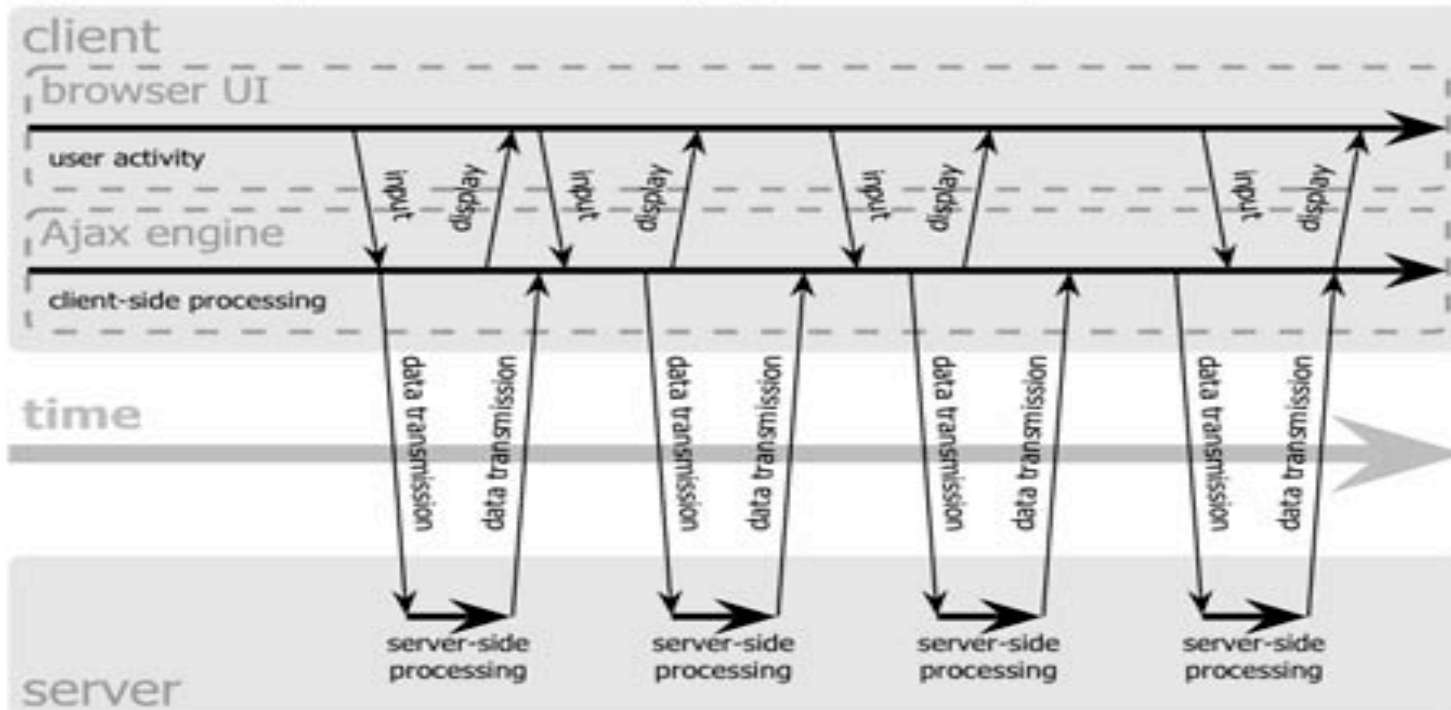
AJAX Begin typing the word, see possible matches as you type and the definitions as soon as you finish typing, like [ObjectGraph](#)



classic web application model (synchronous)



Ajax web application model (asynchronous)



AJAX advantages

- AJAX has the ability to request/receive data from the webservice **without** refreshing the whole page (great for responsive GUIs, portlets etc...)
 - load a page and AJAX runs in the background communicating with web services.
- Google, Yahoo etc. now see AJAX as delivering the "one web page as application"
 - develop client side "frameworks" to manage application complexity within "one web page"



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Web2.0 for Learning

- Work from a Partnership between
- University of Hull
- (Robert Sherratt and Steve Jeyes)

- Icodeon Ltd (Warwick Bailey)

- NRICH Maths at Cambridge University
- (Mike Pearson and Charlie Gilderdale mainly)



A UK JISC ELF demonstrator using the ADL coLab/ ISIS/ ASSIS Simple Sequencing outputs and NRICH's wealth of developing Maths learning activities / problems etc



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Why did we do it ?

- Easy creation of standards conformant sequenced learning trails incorporating resources from NRICH
- Introduce explorative games-based educational environments
- Use Simple Sequencing creatively to help a learner
 - capture pedagogical strategies for problem solving (Systematics teaching)
 - develop thoughtful play leading to useful reflective insights and methods of solution



Capturing the Pedagogy

- Trying to reflect Charlie Gilderdale's Classroom practice
- Explorative and developing systematic approach
- Reflect on evidence / knowledge to produce deep learning



V Card Trail

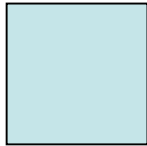
- Teaching Systematics
- The structure and tools for problems
- Capturing Teacher / Learner dialogue
- Charlie Gilderdale storyboarding with 138 ppts with problems , hints, directions etc
- Converted to active simulation (Flash) and relevant docs (XHTML etc)
- Being sequenced to mimic the appropriate Teacher intervention



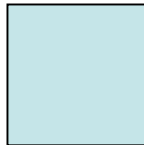
Card 1

Length of arms	3
Start no.	1
Increment	1
No. of solutions	3

Timed	No
Time allowed	n/a
Start Number Range	n/a
Increment range	n/a



Objective:
Find all solutions



Hint text:
Try all the different possible numbers at the bottom.



Submit sequence:
Finished if learner has found all solutions and thinks so.

Suggested Level: 1

Bundle D

Cards 17, 18, 19, timed challenge D and Truth Bags D

1

To progress from level 2 to 3

- This section focuses on the arm totals.
- The Level 3 challenges are split into 2 parts.
- In the first, you must collect statements for your truth bag, and complete a timed challenge.
- In the second part, you must complete the timed challenge.

2

Part One

- Even numbers
- Odd numbers
- Multiples

3

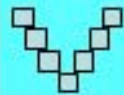
Even Numbers

4

Card 17a

Statement	True	False
1		
2		
3		

Statement	True	False
4		
5		
6		



Objective

Collect 6 statements

Find 6 tiles

Find 6 tiles

Find 6 tiles

Find 6 tiles

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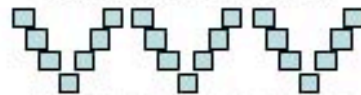
Find 6 tiles

Find 6 tiles

5

Card 17a done

Well done you have a complete set.



Take a tile to all of your solutions and place it on either your solution bag, under the relevant statement.

Can you find any other solutions? Are there any other solutions?

What is the smallest set of tiles you can have?

6

task

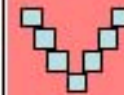
- Investigate to find out what the solutions would be for any set of 7 consecutive even numbers.

7

Card 17b

Statement	True	False
1		
2		
3		

Statement	True	False
4		
5		
6		



Objective

Collect 6 statements

Find 6 tiles

Find 6 tiles

Find 6 tiles

Find 6 tiles

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Find 6 tiles

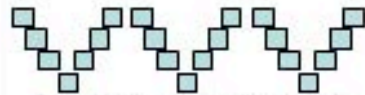
Find 6 tiles

Find 6 tiles

8

Card 17b done

Well done you have a complete set.



Can you find other solutions? Are there any other solutions?

What is the smallest set of tiles you can have?

9

Go to truth Bag

- Go to truth Bag statements 1,2,3

10

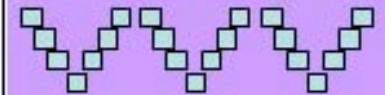
Truth Bag α()

- Three statements follow. Answer as many as you can. You can review your truth bag at the end of the section.

11

For any starting number in an even number sequence

- There are always 3 solutions



Play with solutions 1

1

2

3

4

12

For any starting number in an even number sequence

- The numbers at the point are ... multiples of 4



Play with solutions 1

1

2

3

4

5

6

For any starting number in an even number sequence

- The totals of the solutions are ... consecutive even numbers



Play with solutions 1

1

2

3

4

5

6

Odd Numbers

Card 18a

Statement	True	False
1		
2		
3		

Statement	True	False
4		
5		
6		



Objective

Collect 6 statements

Find 6 tiles

Find 6 tiles

Find 6 tiles

Find 6 tiles

Find 6 tiles

Find 6 tiles

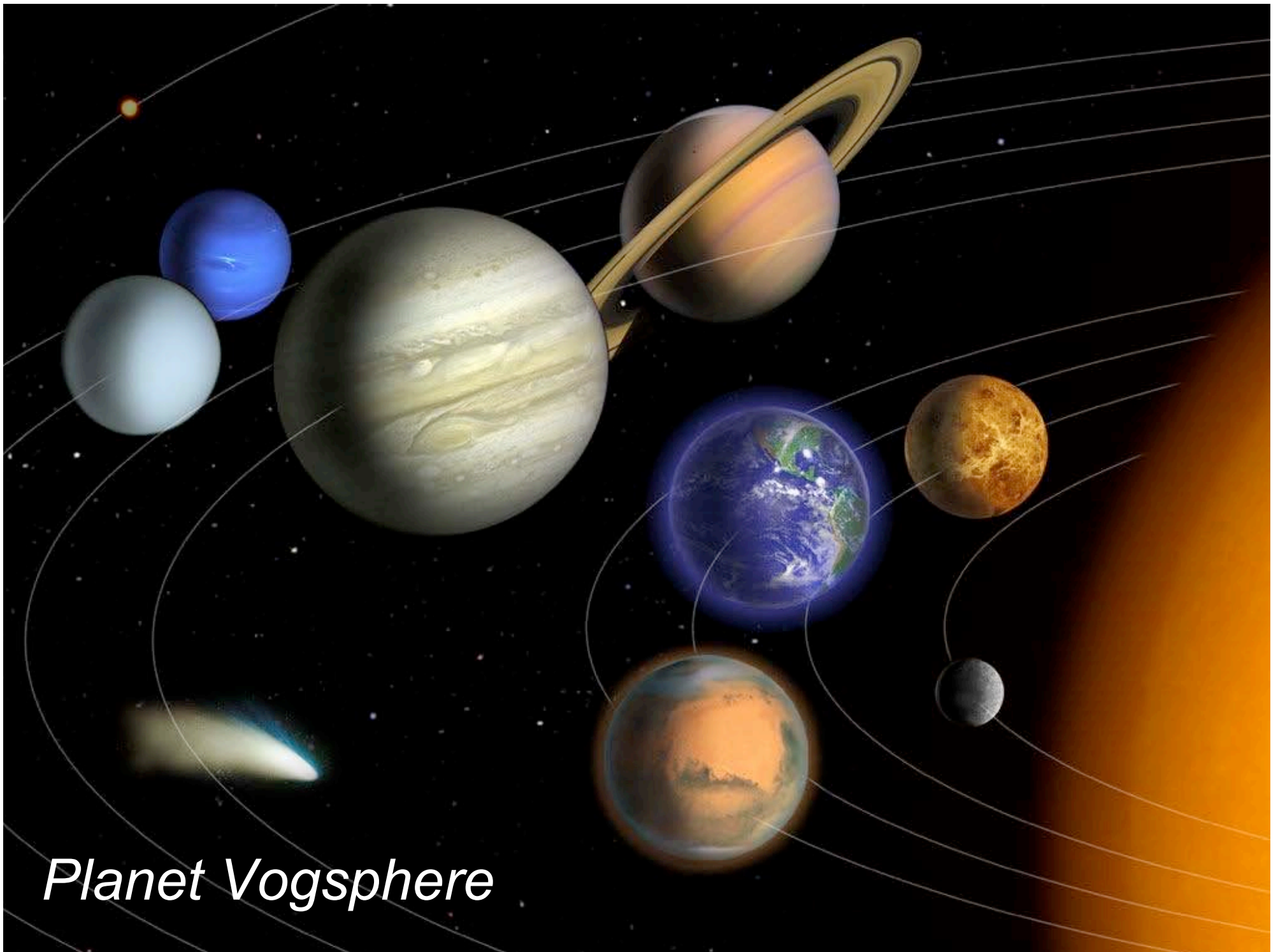
Find 6 tiles

Find 6 tiles

Find 6 tiles

Find 6 tiles

13



Planet Vogsphere



Planets unavailable grey

Demo and Fallback

http://www.scormtech.com - Icodeon SCORM 2004 Run Time Environment

Title: Arrival

The V System

We will shortly be arriving at Avalon, an ancient planet of the V System.

Like other planets in this system it is guarded by benign shield generators originally designed to protect its people from innumerate life forms.

Sadly, the inhabitants have long since left, but the shield generators remain active in case they should return. Your task is to land on each planet and learn how to move through the shield gates at will. Be bold, be logical and *good luck!*

Your communicator has been programmed to assist you and to record your discoveries in the ship's log.

Proceed

Activity Tree < Previous Continue > Exit

Transferring data from www.scormtech.com...

http://www.scormtech.com - Icodeon SCORM 2004 Run Time Environment

Title: Landing

Planet Avalon

shield 1

Shield gate encountered.

Drag the numbers from the green pads to the pink pads to try to open the shield gate.

Aims

Instructions

Hints

Activity Tree < Previous Continue > Exit

Read www.scormtech.com...

Title: **Landing**

The V System	
	Arrival
Planet Avalon	
→	Landing
	Ridge
	Cliff
	Cliff Top
	Timed Challenge
	Practice Zone
	Aboard Ship
Planet Beva	
	Aboard Ship
Planet Cevu	
	Aboard Ship
Planet Dvyus	
	Aboard Ship
Planet Eva	
	Aboard Ship

The main game area features a 3D landscape with a shield gate. Above the gate are five green circular pads numbered 1, 2, 3, 4, and 5. Below the gate are five pink circular pads. A yellow key is visible in the background. A text box at the bottom of the main area provides instructions: "Shield gate encountered. Drag the numbers from the green pads to the pink pads to try to open the shield gate."

Planet Avalon

shield 1

Aims

Instructions

Hints

☑ Menu

← Back Next → ✖ Exit

Title: Cliff

Planet Avalon

- shield 1
- shield 2
- shield 3

Proceed

Great!
The shield gate has opened.

Activity Tree

< Previous

Continue >

Exit

Title: Ridge

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The V System
Arrival
Planet Avalon
Landing
→ Ridge
Cliff
Cliff Top
Timed Challenge
Practice Zone
Aboard Ship
Planet Beva
Aboard Ship
Planet Cevu
Aboard Ship
Planet Dvyus
Aboard Ship
Planet Eva
Aboard Ship

The main game area features a 3D landscape with a blue sky and a winding path. At the top, five green circles with numbers 2, 4, 6, 3, and 5 are arranged in a line. Below them are three blue circles, each containing a cluster of red and orange numbers. The leftmost blue circle contains numbers 3, 2, 4, 5, and 6. The middle blue circle contains numbers 3, 4, 6, 5, and 2. The rightmost blue circle contains numbers 2, 3, 6, 5, and 4. A large yellow key is positioned in the center of the landscape. On the right side, there is a vertical panel titled "Planet Avalon" with two entries: "shield 1" with a grey circle and "shield 2" with a pink circle. Below the key is a green "Proceed" button.

Take a look at your key parts and see whether you notice any patterns in them before carrying on.

☑ Menu

← Back Next → ✖ Exit

The V System	
Arrival	
Planet Avalon	
Landing	
→ Ridge	
Cliff	
Cliff Top	
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Practice Zone	
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Planet Beva	
Aboard Ship	
Planet Cevu	
Aboard Ship	
Planet Dvyus	
Aboard Ship	
Planet Eva	
Aboard Ship	

Planet Avalon

- shield 1
- shield 2

Message from Captain

We can now confirm that all gates in the V system have similar requirements; the two arms of the V must add to the same total.

Aims

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Aboard Ship
Planet Cevu
Aboard Ship
Planet Dvyus
Aboard Ship
Planet Eva
Aboard Ship

Planet Avalon

shield 1

shield 2

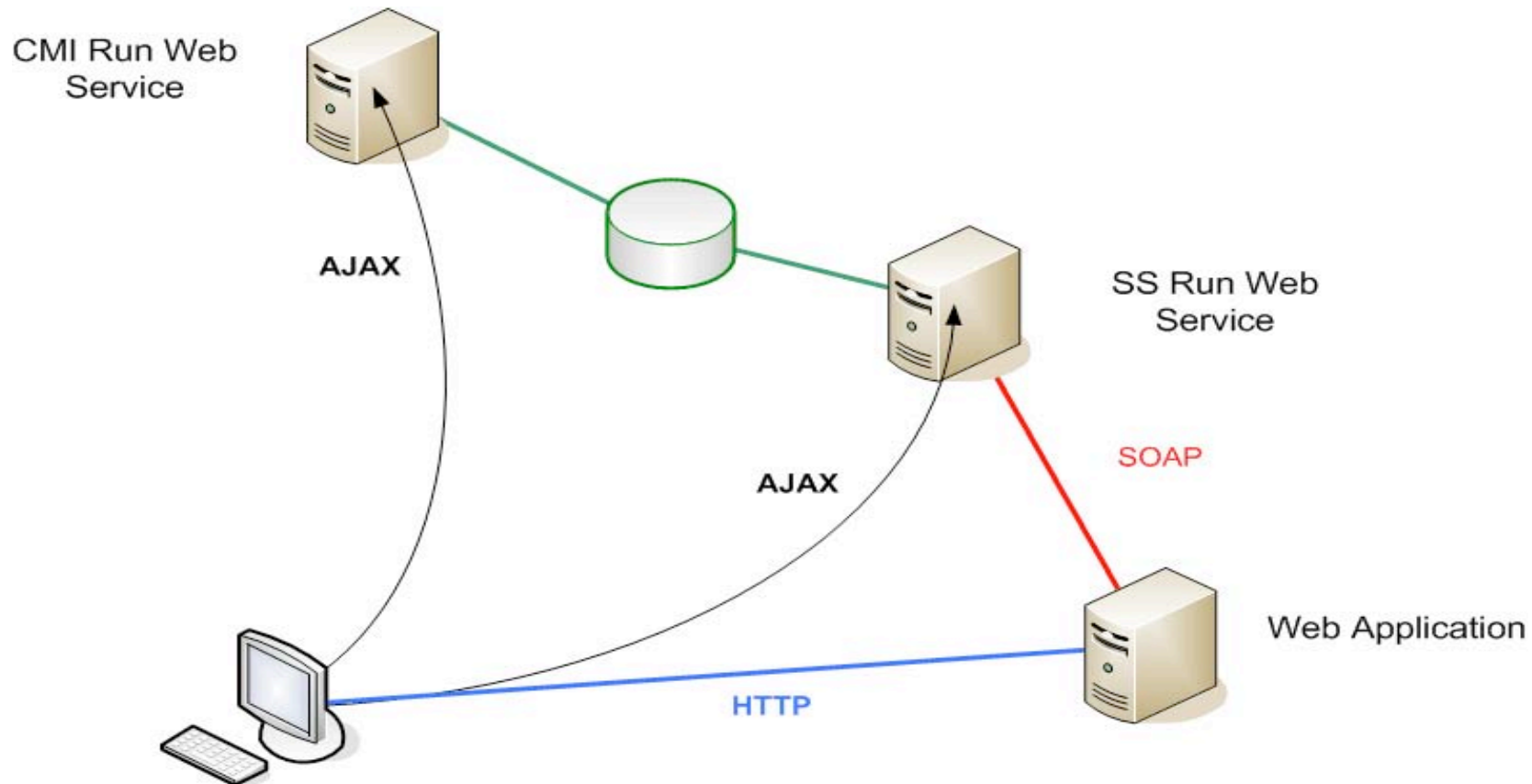
back next

Proceed

Ship's Log [A.2.2] Avalon shield 2
The two arms of the V must add up to the same number.

True True so far Undecided False

Technical Overview



Running AJAX

- Used To dynamically update our "menu".
 - (i) A sequencing request(start, continue, previous etc) is sent to SS
 - (ii) The sequencing service(SS) uses the sequencing engine to figure out what activity (SCO) is next in sequence.
 - (iii) This process changes the state of the entire sequencing activity tree held by the sequencing service.
 - (iv) Next activity (SCO) is sent to the browser.
 - (v) When next activity (SCO) has loaded, this triggers an AJAX call to get the state of the sequencing activity tree from SS
 - (vi) state of the sequencing activity tree held by SS is returned to the browser (without refreshing) and used to update the "menu".
- Thus "menu" items (visible/invisible, active/greyed out, expanded/collapsed etc) were continually dynamically updated with every change in state



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Why is MakingTracks Web 2.0?

- From Tim O'Reilly's paper "What is Web 2.0" features used are
 - <http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web20.html>
- AJAX group of technologies
- Small pieces (joined web components)
- Rich user Experience
- Play / game based
- Granular addressable content
- Emergent - user behaviour not predetermined



WS data exchange styles

- Four levels:
 - RPC/encoded
 - RPC/literal
 - Document/encoded
 - Document/literal/wrapped
- Doc/literal wrapped enables the XML to be sent as a single object and is WS-I compliant



What did AJAX do

- Enabled by the ‘document literal model’ data exchange
- Allows the exchange of native XML between the service and client
- The Ajax client allows the parsing of whole XML objects using XSLT
- Enabled us to display adaptive dynamic menus for the first time



AJAX Reflections

- AJAX is very lightweight, fast in development and well supported by all modern browsers.
- Once a Web Service "provider" has been published, creating a simple AJAX client "consumer" is easy
- Just need a text editor to write XHTML and JavaScript.
- This contrasts strongly to Web Services invoked from web applications, or calling BPEL engines from web applications
 - require much more time, effort and infrastructure to put together



Ajax enabled SOA

- Ajax interfaces enable the smaller scale, rapid integration of services and their user interfaces
- “If you can start to connect your user interface to your services on the back end, then you've really got something. It would [bring] the possibility of service reuse into a vendor-neutral client tier.”
 - Pieter Humphrey Senior Product Marketing Manager, BEA Systems Inc.





Questions

- www.hull.ac.uk/esig
- R.sherratt@hull.ac.uk
- Steve.jeyes@edexcel.org.uk



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