How Zones Served Queen Victoria

Peter Tribble ProQuest



The speaker...

Full time sysadmin

Solaris, Linux, other unices...
Jack of all trades
Application focus

Part time developer/enthusiast

OpenSolaris
Governing Board Member

ProQuest

Online Publisher, US parent I deal with mostly literature and historical data - Early English Books, Early European Books - Vogue - Literature Online, Film, media, video Periodicals Digital scans, indexing, strong search Customers – academic, universities, research - Not individuals or the public

One day

"We've got this project..."
Short term, high traffic
Very public, on national media
High profile, fantastic PR
Potential for egg on face
Can we build it?

Queen Victoria's Journals

Princess Victoria started a journal in 1832 Carried on as Queen until her death in 1901 141 volumes, 43765 pages Digitally scanned

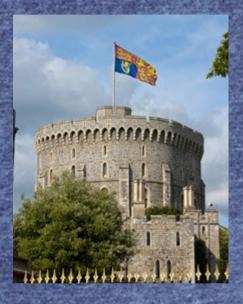


Initial Evaluation

• Let's assume it's on the BBC News - And national newspapers • And 1 million page views per day Given existing similar sites System infrastructure will be easy Network load might be interesting - Maybe 300M/s

Handling the data

 Scanned/photographed Stored on ZFS ImageMagick Zoomify • Replicated image servers Reprocess until customer happy • Keyed data for search





Handwriting

Handwritten texts only exist from the time before Victoria became queen

Only 13 small purple and marbled volumes survive

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Standard Architecture

 Use Solaris with Zones for everything Sparse root, very lightweight - Guarantees every system is identical Application lives in one place – /opt/proquest • Private application stack - Independence from vendor, patches • Replicate horizontally - Just copy the one directory (+extras)

Application layout

/opt/proquest

Same on every zone /opt/proquest/{apache,java,tomcat} - Read-only (root -owned) /opt/proquest/qvj/{apache,tomcat} - Configuration and logs only Virtualization at every level System, application, application instance

Princess Beatrice Transcripts

Manually transcribed after Victoria's death On her instructions Sanitised and edited Originals destroyed Sketches and doodles cut and pasted Finished in 1940

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Build a zone

zonecfg -z qvj -f zconfig.qvj

create set zonepath=/storage/zones/qvj set autoboot=true add net set physical=igb0 set address=172.18.1.36/24 end add fs set dir=/opt/sfw set special=/opt/sfw set type=lofs set options=ro end add fs set dir=/opt/proquest set special=/storage/qvj/opt/proquest set type=lofs end verify commit

What we do NOT do

Manage the zone

- No packaging, no storage delegation

- It's all about the application

Patch zones

Migrate to newly patched host, then patch server
 Migrate zones

- Save app, destroy zone, build new zone, restore

Lord Esher transcripts

utummin and

First Keeper of the Royal Archives Typewritten Unknown to Beatrice Unabridged 1832-1840

WINDSOR CASTLE 0-ct-10 1830 whom I found grown and changed, and embellished. It was with some emotion that I beheld Albert - who is beautiful. I embraced them both and took them to Me; having no clothes they couldn't appear at dipper. At 8 we dined. Besides our old party, Lady Clanricarde, Lord and Lady Granville, Baron Brunow, Lord Normanby, the Hon, William Temple and Mr. Murray (who returned), dined here. I sat between Baron Brunow and Lord Melbourne. Talked to Lord Melbourne of my cousins having no baggage; Lord M. wasn't tired; I said I found my Cousins so changed. X Lord M. was quite well; talked of my having a headache; "I must confess," said Lord M., "I think that pork disagreed with me yesterday". I said I was sure it did, as nothing was so unwholesome; "I didn't like to own it before," he continued. And what made him own it? I asked; "A fit of candour", he said. I observed he often said he was well, When he wasn't, as it made him impatient to be asked how he was. Talked of my cousins' bad passage; their not appearing on account of their neglige, which Lord M. thought they ought to have done, at dinner and certainly after. "I don't know what's the dress I Would appear in. if I was allowed", said Lord M., which made us laugh so. × Talked of Brunow being rather a bore; Lady Clanricarde looking well; Lord M. hadn't slept, we Normanby had come to him; I said laughing it was unallowable his sleeping full length on the Bofa as he did one night in the Gallery.

After dinner, my Cousins came in, in spite of their neglige,

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Production Infrastructure

 Load balancer handles individual failures • N web zones (2, 4, 8) apache/tomcat • M search zones (Solr in this case) Separate url and zones for images - Offsite at Everycity during launch Our normal site has MySQL – this doesn't - Authentication (free to UK) - History and personalization (remove)

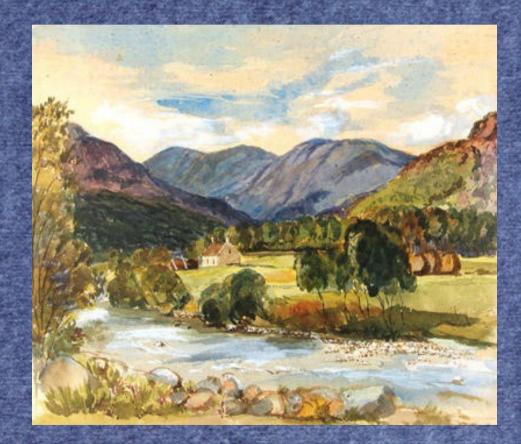
System Capacity

Most of our sites use tomcat, so each zone needs approx 2G of RAM OS overhead is essentially zero Typically low traffic, so memory is the constraint Even on busy sites, the application is a bottleneck So we basically size for RAM, and add zones until (just before) we start to swap Actually need to add lots of swap

The Artist

Queen Victoria was a keen artist Scanned many of her sketches Also many illustrations in the journals





Testing, testing...

Lots of new technologies (in our context) Solr, no mysql, GeoIP - And go to current versions in the stack Need to work on each of those - Easy - create a zone - Actually, lots of zones... Use our standards to create lots of clones - Clone the app, not the zone

Performance

Normally, we are low usage (but high value) Critical bottleneck – MySQL – was obvious - Removed very early Complete environment cloned using zones - And a whole bunch of load generators Actual testing almost trivial - Plain wget + ab Components + whole stack

Fixes

1 page was horrifically expensive ->2s to render afresh with each request - Generate once, save, serve that HTML is extremely verbose - mod gzip made a huge difference Design images unoptimized 5x improvement possible Timeline sent twice for Mobile - Detect before sending the data

Dueen Victoria's Journals

"My poor old birthday ever returning without him, who made all so bright"

Timeline Browse Journals Illustrations Search Resources About Hame

A message from HM Queen Elizabeth II

In this the year of my Diamond Jubilee, I am delighted to be able to present, for the first time, the complete on-line collection of Queen Victoria's journals from the Royal Archives.

These diaries cover the period from Queen Victoria's childhood days to her Accession to the Throne, marriage to Prince Albert, and later, her Golden and Diamond Jubilees.

Thirteen volumes in Victoria's own hand survive, and the majority of the remaining volumes were transcribed after Queen Victoria's death by her youngest daughter, Princess Beatrice, on her mother's instructions.

It seems fitting that the subject of the first major public release of material from the Royal Archives is Queen Victoria, who was the first Monarch to celebrate a Diamond Jubilee.

It is hoped that this historic collection will make a valuable addition to the unique material already held by the Bodleian Libraries at Oxford University, and will be used to enhance our knowledge and understanding of the past.

Elyabeth

Essays: Queen Victoria's Coronation, by Sir Roy Strong



Queen Victoria's coronation portrait. Painted by Franz Xaver Winterhalter 1838 Supplied by Royal Collection Trust / @ HM Queen Elizabeth II 2012

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From the journals

Other tricks - ZFS

Each zone has its own zfs file system - Just 1, so managed as a single unit - Automatic snapshots (daily) - Compression enabled (great for logs) Corrupted zone? Roll back Shut down zone zfs rollback Boot zone

Other Tricks - SMF

All services managed using SMF Trivial start/stop - Clean application environment - Dramatic reduction of trivial call-outs • Developers/app owners have privilege Just to restart, not to modify boot state Assign net privaddr if appropriate - All applications run on the "official" port SMF still has rough edges



Thank You

http://www.queenvictoriasjournals.org/