

The background features a stylized San Francisco skyline in shades of blue, including the Golden Gate Bridge on the left and the Transamerica Pyramid in the center. The skyline is set against a background of radiating blue lines that create a sunburst effect. The main text is contained within a white rectangular box with a black border.

SUGARCON

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2017

PERFORMANCE TUNING FOR SCALE

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Director of Engineering (Professional Services)

Rajesh Badhe
Software Development Architect (Engineering)

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SADEK BAROUDI

Director of Engineering

- Leads the technical team in SugarCRM Professional Services.
- One of the key technical drivers behind the company's largest implementation of Sugar.
- One of the longest tenured employees at 12 years
- Some key areas of expertise are:
 - Development
 - Architecture
 - Continuous Integration and Deployment (CI/CD)
 - Dev, Build, and Deployment Automation



RAJESH BADHE

Software Development Architect

- Engineering lead for performance
- Joined SugarCRM in 2015
- Past:
 - Worked at BMC software for 16+ years
 - Truesight (orig - ProactiveNet Performance Management)
 - Cloud Lifecycle Management product

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PERFORMANCE TUNING FOR SCALE

This session will focus on explaining the performance considerations for designing and coding Sugar solutions. When there are large data sets then performance can be affected in a variety of ways. Attendees will learn about the controls they have on system performance and how to use them.



AGENDA

Performance Tuning for Scale

- System Architecture
- Dependencies Configuration
- Sugar Configuration
- Tweaks for performance in larger implementations
- Diagnostic tools (dev and production)
- Q&A



SYSTEM ARCHITECTURE

- **Browser** - local interface to run the Sugar application
- **Javascript, backbone, jQuery, bootstrap, handlebars** - client side application languages
- **Apache** - web server
- **PHP** - server side application language
- **Zend Opcache** - PHP opcode caching
- **NFS mountable NAS/SAN** - shared file storage for application servers
- **Cronjob** - scheduled background jobs
- **Elasticsearch** - full text search service
- **Redis** - key/value storage caching and session sharing between application servers
- **Database**



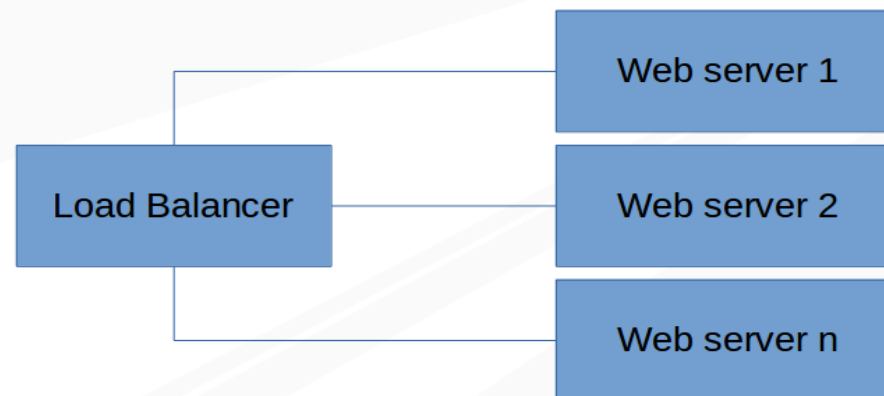
SYSTEM ARCHITECTURE

- Separate servers / services for each component
- Allows for granular allocation of resources based on demand
- Each component should be redundant and scalable



SYSTEM ARCHITECTURE

- The general principle is to create a horizontally scalable connection for each Sugar component.
- In the example below, we ensure that we can provide additional web servers in the future without interruption
- You can do this for all components within Sugar

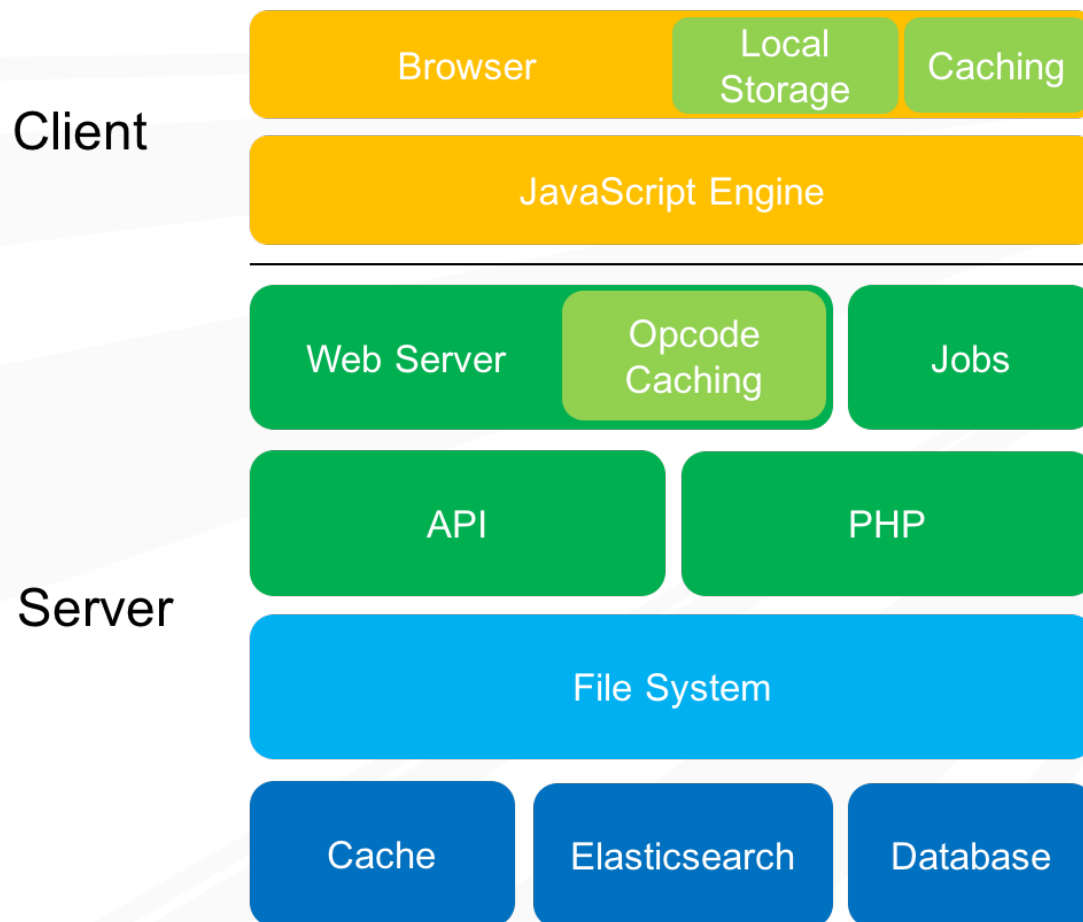


DEPENDENCIES CONFIGURATION

- Thoroughly Review the installation guide!!
 - http://support.sugarcrm.com/SmartLinks/Installation_and_Upgrade_Guide/index.html
 - Google search "Sugar Installation Guide"
- This will get you started with optimal dependencies configuration for performance



DEPENDENCIES CONFIGURATION



SYSTEM

- Deploy geographically close to majority users
- Monitor
 - CPU, disk, memory
 - Network and I/O
 - Swap space

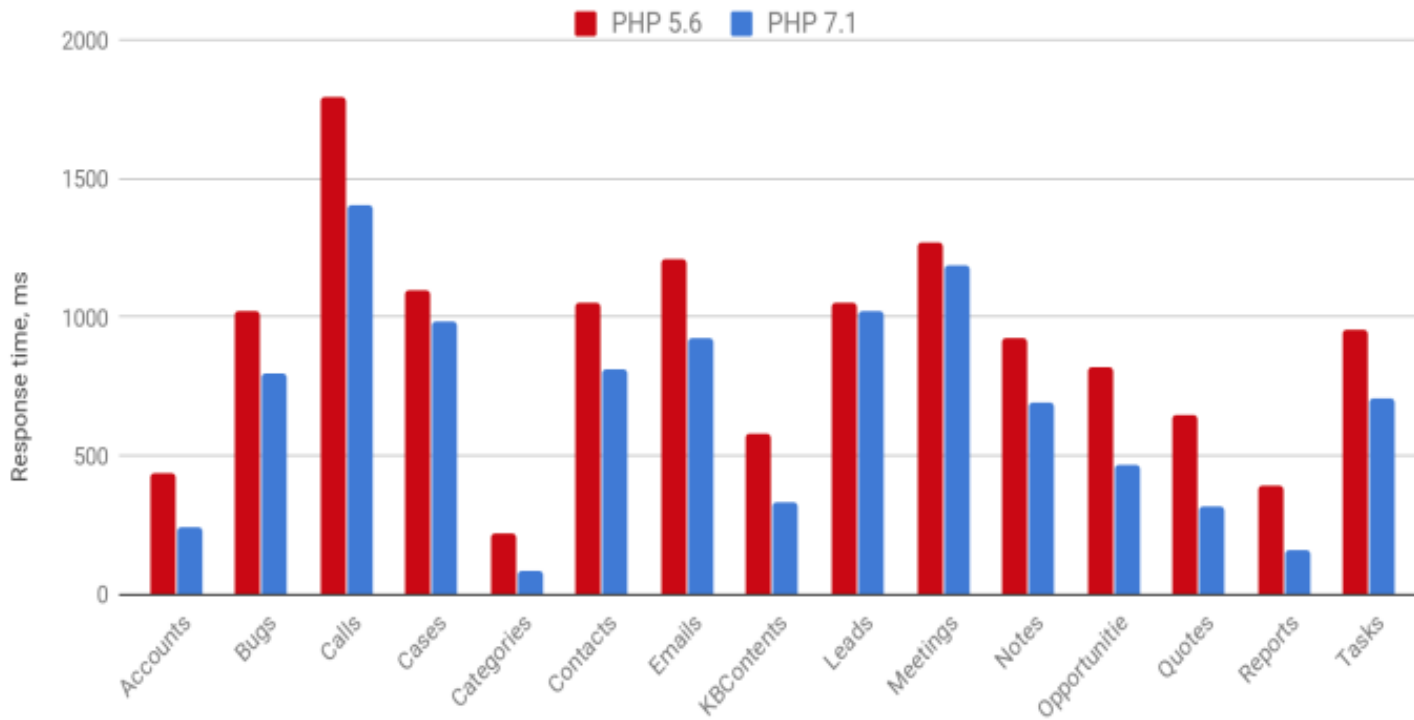


PHP CONFIGURATION

- PHP memory limit (min 512MB)
- date.timezone = <your timezone here>
- realpath_cache_size = 512k
- realpath_cache_ttl = 600
- Use Opcache
- Store sessions in Redis
- Disable unnecessary php extensions



PHP 7.1 VS 5.6 PERFORMANCE PROFILE



DATABASES

- **MySQL**
 - 80% server memory. Typical average size deployment has 16GB RAM
 - Use master slave configuration. Slave to serve Reports and ListView
 - Make sure InnoDB storage engine is used
- **MSSQL**
 - Use built in profiler
 - Use “update stats”
- **Oracle**
 - Use “update stats”
 - Compact DB
 - Maintenance scripts



ELASTICSEARCH

- 40% resources at minimum if not dedicated
- 8GB RAM (minimum)
- Build a cluster with odd number of nodes



CACHE COMPONENTS

- Redis or Memcache for PHP session storage
- ZEND cache
 - Keep memory 2 times size of Sugar cache directory
- Redis or APCU cache for external cache



SUGAR CONFIGURATION

- Listview and subpanel items per page
- Disable developer mode (default)
- Set log level to 'Fatal' (default)
- Prune database every month
- Schedule heavy jobs at slower intervals
- Disable tracker performance and tracker queries (default)
- Disable related calculated fields (functional impact)



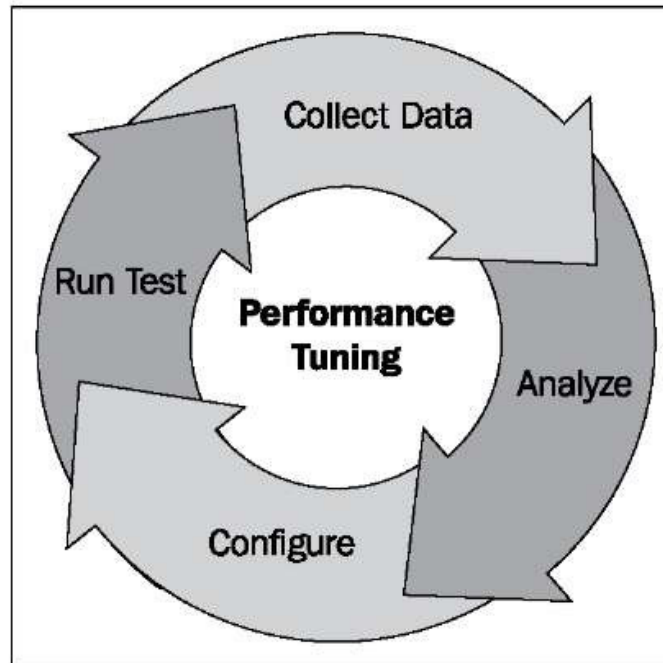
SUGAR CONFIGURATION (CONTD..)

- Reports, Dashlets, Subpanels and List view data from a slave database
- Hide all subpanels or per session for BWC modules
- Disable count from list view for BWC modules
- Disable automatic searches on list views
- Disable client IP verification



PERFORMANCE TESTING

- Replica environment
- Run performance tests regularly
- Data generation tool - Tidbit
- API load testing (JMeter based)
- Front end performance testing (Cucumber JS)



TROUBLESHOOTING PERFORMANCE ISSUES

- Process of elimination
- Check sizing of the infrastructure
- Isolate UI rendering versus backend by using Chrome developer console
- Use Xhprof or Tideways PHP profiler
- Look at slow query log
- Inspect database explain to add missing indexes



TWEAKS FOR PERFORMANCE IN LARGER IMPLEMENTATIONS

- Database governors for long running queries
- Disable sorting on unindexed columns or joined data that cannot use an index
- Disable listing data without at least one filter applied
- Ensure that users cannot generate a list with a large result set
 - Note: if Elasticsearch is used, this is okay
- For instances where a large result set is required, use Elasticsearch instead



LETS WRAP IT UP!

Questions, Resources and Follow-up

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RESOURCES AND FOLLOW-UP

•Resources (Links)

- [Performance config options](#)
- [Sugar Performance Tuning guide](#)
- [Sugar 7 Test Tools blog post](#)
- [Sugar sizing guide](#)

•Follow Up (Activities)

- Read Sugar Developer Guide, Advanced configuration options
- Request access to Sugar Performance Test tools
- Attend session “Best Practices for Designing Advanced Workflows”
- Attend session “The Wall of Questions”

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QUESTIONS?

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