High Performance Online Marketing

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Agenda

- What's new in version 10

- Performance impact of EMS features

- Caching and EMS

- Email sending

- Contacts & Activities

- Other tasks

What's new in MA/OM

- Marketing automation trigger speed

- Contact management / on-line marketing feature performance

- Ability to handle a ridiculous amount of contacts and activities

- **CMSCreateContactActionsLogWorker**
  - Dedicated server for online marketing tasks

Kentico 10 tested limits

Total number of stored contacts: 100 million (10^8)
Total number of logged activities: 1 billion (10^9)
Used on-line marketing features:

- 10 condition-based contact groups
- 2 scores for evaluating contacts
- 2 personas
- 3 marketing automation processes (process triggers: 1 activity-based, 2 score-based)
- 2 running campaigns

Page load time was under 1 second for at least 95% of all live site web requests.

Kentico 10 tested limits – configuration

Test number #	Hosting configuration	Page requests per second	Concurrent visitors
1	1 web server	600 (300 from new contacts)	9000
2	Web farm with 4 servers: 1 designated for recalculations of on-line marketing data Session state synchronized using Azure Redis Cache (Standard C6)	1600 (800 from new contacts)	25000

Web server	Processor: 2,4 GHz Intel Xeon E5-2673 v3, 8 cores RAM: 28 GB Drive: 400 GB, 500 IOPS
Database server	Processor: 2,4 GHz Intel Xeon E5-2673 v3, 16 cores RAM: 56 GB Drives: 3x SSD 1024 GB, 5000 IOPS (1 for data, 2 in RAID0 for the database log file)

Performance impact of EMS features

- **Frontend features**

  - A/B testing - Low
  - MV testing - Medium
  - Personalisation - High

- **Backend features**

  - Segmentation - Low
  - Email campaigns - Medium
  - Marketing automation - High

Performance impact of EMS features

- **Personalization**

  - Identify static content and apply partial caching
  - Consider using substitution macros and output caching
  - Consider using custom solution

- **Marketing automation**

  - Optimise custom macro rules
  - Optimise email sending

Caching and EMS output caching

- Quick and dirty way how to improve performance
- User, browser and device-profile specific by default
- A/B tests supported
- Activities are tracked
- **Default personalization cannot be used if user is NOT logged in**

Key: outputdata|http|/kentico10/articles|username=|sitename=dancinggoat|lang=en-us|browser=safari39
chrome39|cookielevel=1000|deviceprofile=

Key: outputdata|http|/kentico10/articles|username=administrator|sitename=dancinggoat|lang=en-us|browser=safari52
chrome52|cookielevel=1000|deviceprofile=

Caching and EMS

- Segmentation group specific caching
    - Allows you to use output caching and personalization at the same time
    - Generate unique cache based on current persona
    - https://devnet.kentico.com/articles/context-dependent-output-caching

Key: outputdata|http|/kentico9/||username=|sitename=corporatesite|lang=en-us|browser=gecko47|cookielevel=1000|deviceprofile=|persona=1

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Email sending

- **EmailSender.SendEmail**() – Plain text email or template + macro resolver overloads

- If the **Email queue** is used it is generated and saved in it, otherwise it is sent to an **application queue** for immediate sending

- **Application queue**
  - Asynchronous thread sends the email on an available SMTP server as per configuration
  - If the SMTP server is unavailable, the message is retried once more on the next run
- **Email queue**
  - Processed by a scheduled task executed every minute by default
  - Messages are delivered in an asynchronous thread. The same process follows as above

Email sending recommended settings

- **Enable the email queue**
  - Allows for multiple SMTP servers and provides info on the status of your emails
- **Disable archive sent messages**
  - Grows databases. Unless needed for regulatory or debugging purposes, avoid it
- **Use multiple SMTP servers or pickup directory**
  - Can increase your throughput from the Kentico side while adding redundancy in the event of failure
- **Use the same SMTP settings**
  - Allows system to create parallel threads
- **Use the external scheduling service**
  - Enables email tasks to be processed on a regular schedule independent of page requests
- **Use the built-in email marketing functionality**
  - Utilize a lot of built-in functionality that makes managing the mass emails easier.

Email sending recommended approach

- Get the **acceptable delay** between user action and email delivery (considering email volume)

- **Test** the default configuration with recommended settings

- **Identify** the bottleneck:
  - Emails are **generated too slow**
  - Emails are generated fast enough but **delivered too slowly**

- Optimize depending on previous tests

- To speed up generation of emails consider:
  - **Reducing** the amount of **dynamic/personalized content**
  - **Reducing** the number of **links**
  - **Static HTML emails** (dynamic emails)

- To speed up delivery consider:
  - Adding **additional SMTP** servers
  - **Duplicating** the current **SMTP server(s)** in Kentico
  - Increase the batch size **CMSEmailSendLimit**
  - **Dedicated environment for email sending**
  - **Alternatives to SMTP delivery**
    - (e.g. Web API for SendGrid)
  - **Dedicated** hosted **SMTP infrastructure**

Email sending considerations

- **Post delivery spikes**
  - Optimize campaign landing pages
  - Apply caching
  - Reduce the amount of dynamic content on landing pages
  - Consider hosting the pages outside of the CMS

- **Slow system during mail outs**
  - Consider using a dedicated environment for email send outs
  - Scale out
  - Scale up

Email sending real-life metrics

Kentico website using dedicated MTA (Message transfer agent) infrastructure (e.g. port25)

- The setup uses multiple IP ranges to improve deliverability to Gmail

- Sends out 1 million emails within 3-4hours, approx. 200,000 per hour

- Internally creates a web farm with mail servers

- Services such as **SendGrid** using similar infrastructure

- Additional maintenance tasks may be required, e.g. software provider may change email settings every month

- Kentico setup on a 2 web farm server, 32 core CPU

Contacts & Activities

- **CMSProcessContactActionsInterval**
  - Sets the interval in which contact activities are batch processed by the system
  - Consider raising the interval if your system processes a large number of activities

- **CMSCreateContactActionsLogWorker**
  - Server recalculates [contact scores](), [contact groups](), [personas]() and [marketing automation triggers]()
  - Set this key to *false* for one or more of your web farm servers, and the recalculation will be disabled for them.

- **Notes**:
  - If you set the key value to *false* for all of your web farm servers, the recalculation will be disabled completely.
  - Using one server for recalculation improves the web farm's overall performance, but you may experience longer delays between actions on the website and results in the administration interface.

Contacts & Activities

Activities usually account for most of the online marketing data

- [Automated deletion of inactive contacts](#)
  - Runs off peak hours (2AM-6AM) and deletes 1,000 contacts at a time

- [Separate contact management database](#)
  - Allows for optimizing the contact data database for write operations
  - Allows for different backup strategies for the main and contact database

- [Use JavaScript logging for analytics and activities](#)

Other tasks

- **Optimize the SQL server**
  - Set initial size
  - Store log / data separately
  - Store SQL error logs on main data file drive
  - Store **tempdb** on main data file drive

- **Optimize database indexes**
  - Database Engine Tuning Advisor
  - Default list ordering / filtering
  - Custom indexes
  - Integration –specific
    - Example: Salesforce / Contacts

- **CMSLogMATransitions**
  - Transitions between steps of automation processes

- **CMSLogNewsletterIssueEvents**
  - Sending of marketing emails (within email feeds)
  - **Note**: Only affects Event log entries, indicates whether the system logs events into the Event log when objects of the class are modified

Key Takeaways

- Kentico 10 EMS is suitable for most clients from a performance standpoint

- Follow our best practices when setting up the environment(s)

- Identify the bottlenecks and optimize relevant areas

- Disable unused features

- Consider implementing custom solutions for special requirements

Helpful Links

- **Kentico Advantage**
  http://advantage.kentico.com/

- **Devnet**
  http://devnet.kentico.com

- **LinkedIn user group**
  https://www.linkedin.com/groups/970177

- Kentico Community Slack Channel
  kentico-community.slack.com

- **Kentico webinars**
  https://www.youtube.com/playlist?list=PL9RdJplq_ukamszWm4UMmHmtfsebzjXKB

- **Kentico Cloud**
  https://kenticocloud.com/

"Mr. Osborne, may I be excused? My brain is full."
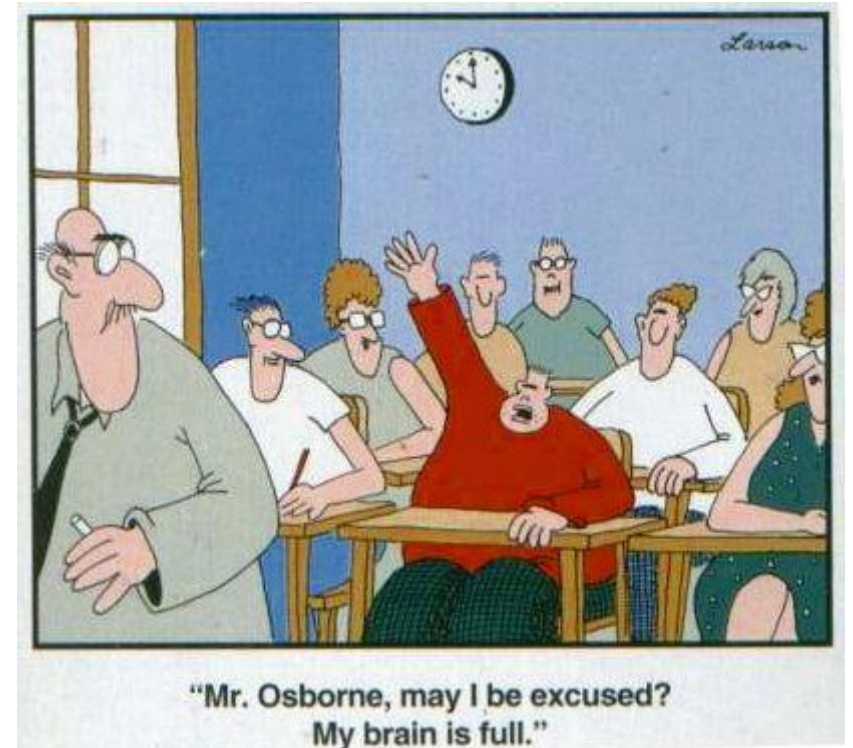
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