

# WORDPRESS PERFORMANCE MONITORING WITH NEW RELIC<sup>®</sup> APM

WHITE PAPER

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## INTRODUCING APPLICATION PERFORMANCE MONITORING



Here at WP Engine, we've partnered with New Relic, leaders in Digital Intelligence, to include New Relic APM Pro as part of a new Application Performance solution.

APM gives development and IT operation teams the visibility they need to build and maintain great WordPress digital experiences.

Application Performance is a tool built to help you combat application and website bottlenecks so you can provide an optimized WordPress experience.

Application Performance provides code-level visibility to help teams troubleshoot faster, optimize their WordPress experiences, and increase development agility.

Through real-time data and detailed charts, your development and IT operations team will be able to gain actionable insights at any time through detailed performance metrics and deep rootcause analysis, as well as monitor alerts when a site deviates.

This visibility is key for giving your teams increased agility and productivity. With APM, you can quickly identify the source of the problem, such as issues with themes, plugins, and APIs.

Discover the root cause of site issues by drilling down into slow queries, transaction traces, and errors. It gives your teams the actionable data to pinpoint problems and keep your sites fast and stable, ultimately providing a satisfying user experience. In addition, you can set a baseline to know when a server is steady and then create alerts if a program goes off track.

You'll be able to attain current and historical information about various performance metrics, including:

- Memory usage
- CPU utilization
- Database query performance
- · Web browser rendering performance
- · App availability and error analysis
- External services
- And more...

## **TOUR NEW RELIC® APM**

Upon logging into Application Performance, you will see a list of "applications" to choose from, which should all correlate to your account's install names. This list will provide you with a quick high-level info overview at a glance about all of your websites.

The table displaying your apps will be color-coded to show overall performance help based on the thresholds you have set. Red indicates that a critical threshold alert has been violated. You can then hover over the red to determine what the issue could be.

Orange (or yellow) means a warning violation has been set off. Green indicates that there are no warning or violation processes that have been alarmed.

You also have the ability to sort column headers by:

- End user response time
- Page views per minute



- App server response time
- Throughput requests per minute
- Percentage of errors

Next, choose the install you would like to view.

## DASHBOARD OVERVIEW

On the Overview page, you will see a number of graphs with data, similar to the image below.



These are all key performance metrics that allow you to quickly determine the health of your website. You can also drill down into more detail if you need to troubleshoot a performance problem.

Here are some various tools you can find within the Dashboard:

#### **Overall Load Time**

At the top left, the largest graph displays the overall load time of the site, sorted by which elements took the longest to load at any given time. Usually you will see PHP taking the majority of the load time, unless your site runs very heavily on custom queries or makes lengthy external calls to other sites.

#### Apdex score

In the top right corner you will see a graph of your site's Apdex score over the time period selected. This graph shows user satisfaction with the performance of the application or site. In this example, with .5 seconds as a threshold, only about 30 percent of users receive a page in under the threshold time, meaning the Apdex score is low. If you see similar results, this could indicate your Apdex threshold is set too low. Please contact WP Engine Support to edit this threshold if needed.

#### Throughput

Just under Apdex you will see the Throughput graph, which tracks the number of requests per minute. Often you will observe

throughput and load time trending in the same pattern, since the number of concurrent requests can affect the application response time. If this is the case, it could mean your content isn't scaling well with the amount of traffic your site is receiving. For help with scaling your site's content to support more traffic, check out WP Engine's Support Garage article: Improving Scalability with Traffic Spikes.

#### Transactions

In the lower left corner you will see a Transactions bar graph which lists the slowest transactions, and underneath a list of three transactions for each grouping. You can click any grouping in the list to get a list of transactions for the group, or click the trace time underneath to see the specific transaction.

#### Error rate

Next to the Transactions bar graph you can find the Error rate, which indicates any PHP Warnings or Fatal errors which have been triggered. Clicking this graph will take you to the Error Analytics tab to investigate your site's errors further.

#### **Recent events**

Last, you will find Recent events at the lower right side. Alerts show any warnings or alerts for Apdex scores higher than the set threshold. In this example, since Apdex is set to .5 seconds, the site will show an alert if it hits over 0.7 seconds as an average for over 5 minutes

## TRANSACTIONS

In the transactions tab you can find meaningful performance data, including full traces of requests to help pinpoint performance bottlenecks.

APPS wpengine  ✓	TIME PICKER SERVERS All servers									
MONITORING	Most time consumina		Top 5 web transactions (2) by percent of wall clock time	a						
Overview	/wp-admin/admin-ajax.php	85.4%	1500 N							
Service maps	/template-home-payroll	3.11%	1250 N							
Transactions	/index.php	2.3%	1000 N		1					
WordPress Hooks	/single-support	1.99%	199X How AMA							
Plugins and the	/template-plans	1.66%	250 K							
mes Databases	/single	1.55%	2.00 PM 2:	tó PM 3:00 PM 3:30 PM	4:00 PM 4:30 P	M				
External services	/single-resource	0.51%	7 wp-outing outinegay prip	Templeterikine payron Tricekorp	angle approx.					
	/wp-login.php	0.43%								
	/template-enterprise-c	0.37%	Throughput (rpm)							
Error analytics	/home 0.23		A							
Alerts	/search	0.19%	marthe	MM. monmor	Muhuhh					
Deployments	/template-campaign	0.17%	100 M 2 . 0 M V V	V-r. White A	V VV VVV-V	y				
PEDODTS	/archive-support	0.16%	2:00 PM 2:	1ό PM 3:00 PM 3:30 PM	4:00 PM 4:30 P	M				
SLA	/template-speedtool-signup	0.14%	Web							
Availability	/archive-our-difference	0.12%								
Scalability	/wp-admin/async-upload.php	0.12%	Transaction traces Sample performance details		Search traces	Q,				
Web transactions	/wp-admin/admin-post.php	0.1%	Date	Transaction / Details	0 App	server o				
Database	/single-affiliate	0.1%	16:22 — 24 minutes ago	/wp-admin/admin-ajax.php	14	4,524 ms				
Background jobs	/template-support-contact	0.1%	15:46 — about 1 hour ago	/wp-admin/admin-ajax.php	18	8,179 ms				
SETTINGS	/taxonomy-support-categories	0.09%	15:38 — about 1 hour ago	/wp-admin/admin-ajax.php	16	6,248 ms				
Application	Show all transactions table		14:45 - about 2 hours ago	/wp-admin/admin-post.php	16	6,036 ms				
Availability monito			14:38 — about 2 hours ago	/wp-admin/admin-ajax.php	2	5,544 ms				



#### **Top 5 web transactions**

In the top right corner you will find a graph of the Top 5 web transactions, which shows the top web transactions by the time consumed. This graph also takes throughput of requests into account, so if you prefer to see data solely considering the total length of request, change the dropdown menu at the top left to "Slowest average response time." Just under this option you will find the total throughput for all transactions.

#### List of transaction types

On the left side you will see a list of transaction types, grouped typically by the template used for each page. By default the list will show "Most time consuming" which accounts for frequency and length of time of each request. To see results sorted only by average length of time, change the dropdown menu to "Slowest average response time." Choose any item in this list to view throughput specifically for these transactions, and a breakdown of the components by time consumption.

#### **Transaction traces**

On bottom right you will find a list of Transaction traces. Full transaction traces are taken when a request is at least four times the Apdex threshold set for your site. Clicking an option from this list will bring up a bar graph and waterfall view of the calls being made from this transaction, to identify bottlenecks. The slowest areas are highlighted in red on the Trace details tab.

5% 10%	15 %	20 %	25 %	30%	35 %	40 %	45 %	50 %	55%	60 %	65 %	70 %	75 %	80 %	85 N	90 %	95 %	100
(closure) WPE	Helpers::m	aybe_start	_session	/wp-	-admin/	′admin∙aja	ax.php	wp_que	ue_posts	_for_terr	n_meta_l	azyload	WP_	Term_Que	ry::get_t	erms		
stagon		Slov	west comp	onents									0	nunt		Duratio	1	
3700001		5101		onents										nunt		UUratio	1	
aregoi y													0					
Custom		{clo	sure}											1		14,000 m	5	55
Custom Custom		{clo WP	sure} EHelpers::r	maybe_st	tart_ses	sion								1		14,000 m 7,670 m	5	55 30
Custom Custom VebTransaction		{clo WPI /wp	sure} EHelpers::r p-admin/ad	maybe_st dmin-aja>	tart_ses c.php	slon								1 1 1		14,000 m 7,670 m 1,100 m	5 5	555 301 41
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Custom Custom VebTransaction Custom		{clo WP /ws wp_ WP	sure} EHelpers::r admin/ac _queue_po _Term_Qu	maybe_st dmin-ajax sts_for_t ery::get_	tart_ses c.php cerm_m terms	sion eta_lazylo	ad							1 1 1 6 3		14,000 m 7,670 m 1,100 m 689 m 311 m	5 5 5 5 5	559 309 49 39 19
Eustom Eustom WebTransaction Lustom Lustom Lustom		{clo WP /wp wp WP gen	sure} EHelpers::r o-admin/ac _queue_po _Term_Qu esis_load_	maybe_st dmin-ajax sts_for_t ery::get_ framewo	tart_ses c.php term_mi terms rk	sion eta_lazylo	ad							1 1 1 6 3 1		14,000 m 7,670 m 1,100 m 689 m 311 m 248 m	5 5 5 5 5 5	559 309 49 39 19 19
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Austom Custom VebTransaction Custom Custom Custom Etemainder Total time		{clo WPI /wp wD_ WP, gen Rem	sure} EHelpers::r admin/ac _queue_po _Term_Qu _term_Qu esis_load_ nainder	maybe_sl dmin-ajax sts_for_t ery::get_ framewo	tart_ses c.php term_mi terms rk	sion eta_lazylo	ad							1 1 1 6 3 1 1		14,000 m 7,670 m 1,100 m 689 m 311 m 248 m 1,560 m <b>25,500 m</b>	5 5 5 5 5 5 5 8	555 301 41 31 15 61 1009

Summary	Trace detail	s Dat	abase queries		
Expand perfo	rmance prob	lems	Collapse all		
Duration (ms)	Duration (%)		Segment	Drilldown	Timestam
25,500		100.00%	/wp-admin/admin-ajax.php		0.000 :
6.0		0.02%	require_wp_db		0.011
6.0		0.02%	> wp_not_installed		0.021
14,000		54.69%	Monitor_Admin_Ajax::write_log		0.081 :
14,000		54.69%	Monitor_Admin_Ajax::_write_log		0.081 :
14,000		54.69%	{closure}		0.081 :
2.0		0.01%	create_initial_post_types		14.074 :
34.0		0.13%	wp_get_active_and_valid_plugins		14.076
353		1.38%	> 4 fast method calls		14.129
28.0		0.11%	run_GFNoCaptchaReCaptcha		14.555
2.0		0.01%	wp_register_plugin_realpath		14.583 :
3.0		0.01%	wp_register_plugin_realpath		14.691
35.0		0.14%	ComposerAutoloaderInit42dca550d72b3b23d972f33dc2605fa0::getLoader		14.765
42.0		0.16%	4 calls to xrstf_Composer52_ClassLoader::loadClass		14.800
32.0		0.13%	Voast_Dashboard_Widget::construct		14.842
5.0		0.02%	xrstf_Composer52_ClassLoader::loadClass		14.874
5.0		0.02%	xrstf_Composer52_ClassLoader::loadClass		14.879
10.0		0.04%	xrstf_Composer52_ClassLoader::loadClass		14.884
6.0		0.02%	WPSEO_Taxonomy_Columns::construct		14.894 :
6.0		0.02%	xrstf_Composer52_ClassLoader::loadClass		14.900 :
3.0		0.01%	xrstf_Composer52_ClassLoader::loadClass		14.906 :
8.0		0.03%	xrstf_Composer52_ClassLoader::loadClass		14.909
4.0		0.02%	wp_register_plugin_realpath		15.020 :
3.0		0.01%	wp_register_plugin_realpath		15.149
4.0		0.02%	wp_register_plugin_realpath		15.168 :
65.0		0.25%	WPMUDEV_Dashboard::instance		15.176 :
254		0.99%	> do_action		15.250
264		1.03%	> do_action		15.533
7,670		30.01%	WPEHelpers::maybe_start_session		15.805
1,960		7.67%	> do_action		23.509
24.0		0.09%	do action		25,509

## DATABASES

In the databases tab you can identify any slow-performing queries, as well as view the number of queries being executed by MySQL or Memcached, and how each is performing.

MONITORING			M.COL susping
Overview	SORT BY		Pryskal over view
Service mans	Pirst time consuming		top database operations by time consumed 80
Transactions	MySQL wp_posts select	17 s	7
WordPress	MySQL wp_postmeta select	5.27 s	
Hooks	MySQL wp_options select	3.57 s	The second second shall be a second
Plugins and the	MySQL wp_terms select	3.22 s	
Databases	MySQL other	0.405 s	•
External services	MySQL wp_rg_form select	0.37 s	230 PM 3:00 PM 3:00 PM 4:00 PM 4:00 PM 5:00 PM
	MySQL wp_usermeta select	0.27 s	MySQL wp_options select
EVENTS	MySQL wp_term_relationships select	0.233 s	
Error analytics	MySQL wp_rg_form_view select	0.22 s	Top database operations by query time
Alerts	MySQL wp_users select	0.216 s	80 ms
Deployments	MySQL wp_options insert	0.159 s	com a second de selected de la selected de la seconda de
	MySQL wp_options delete	0.14 s	
REPORTS	MySQL wp_term_taxonomy select	0.0412 s	in the descent second as " is still if the second
Availability	MySQL wp_termmeta select	0.0403 s	
Scalability	MySQL wp_comments select	0.021 s	2:00 PM 3:00 PM 3:00 PM 4:00 PM 5:00 P
Web transactions	MySQL wp_rg_lead_detail insert	0.0105 s	Ryson (Source Pryson Person Pryson Office
Database	MySQL wp_postmeta update	0.0101 s	
Background jobs	MySQL wp_rg_form_view update	0.0098 s	Top database operations by throughput 15k cpm
SETTINGS	MySQL wp_options update	0.0096 s	12.5k cpm
Application	MySQL wp_rg_lead select	0.0049 s	In an I a A MAN IN A MAN IN A MAN IN A MAN
Availability monito ring Environment	Show all database operations table		zeran zeran
ALERTS >			MySQL update MySQL delete MySQL insert MySQL other MySQL select

#### Time and throughput graphs

On the right side of the page you will see a few graphs displaying the time consumed by each type of query, the total database operations sorted by query time, and the throughput of each type of request. The default view shows "Most time consuming" which accounts for throughput as well as time to complete the query. To view only the slowest queries, use the option for "Slowest query time" in the dropdown menu.

#### **Drill Down graphs**

Choose any item in the list to see the throughput, average query time, and the template calling this query the most. In this example, we can see the slowest query is being called by the /wp-admin/ admin-ajax.php template the most.



ORT BY Slowest query time		MySQL wp	_rg_form_vie	w select						
MuSQI wa ra form view releast	68 3 ms	68.3 ms	3.23 cpm							
MySQL wp_rg_lead insert	17.1 ms	QUERT TIME	THROUGHPUT							
MuSQL was options undate	16.4 ms	125 ms								
MuSOL was pasta lagast	10.4 ms	100 ms			- 1 -					L
Hysical way posts insert	16.4 ms	75 ms		A M		1.	A 4.		1-	4
MySuL wp_rg_rorm_view update	15.9 ms	50 ms		1 MN 1	· · · / //				1.11	
MySQL wp_term_taxonomy update	15.6 ms	25 ma								
MySQL wp_postmeta update	15.5 ms	0								
MySQL wp_options insert	15.5 ms		2:30 PM	3:00 PM	3:30 PM	4	OÓ PM	4:30 PM		5
MySQL wp_options delete	15.3 ms									
MySQL wp_posts update	15.3 ms	Throughput								
MySQL wp_postmeta insert	15.3 ms	8 cpm								
MySQL wp_commentmeta insert	15 ms	6 cpm	۸.	4	1 1	1 1				Ł
MySQL wp_postmeta delete	14.8 ms	4 cpm	I AA IV	1.1.	Army	MA	N. J	MA.	N. J	V
MySQL wp_rg_lead_detail insert	14.5 ms	2 cpm	NW VV "	Mum	~ W ~	V" U	M	"VIV	WW	
MySQL wp_term_relationships insert	14.2 ms	0								
MySQL wp_comments insert	13.9 ms		2:30 PM	3:00 PM	3:30 PM	4	00 PM	4:30 PN		5
MySQL wp_term_relationships delete	13.7 ms									
MySQL wp_posts delete	13 ms	Time consu	mption by caller							
MySQL (subquery) select	8.6 ms									
MySQL wp_rg_lead_detail delete	8.13 ms									
ihow all database operations table										
		0	20.%	33.8 6	50%	60 %	70 %	80 %	90 K	
		/wo-admin/	/admin-alax.php	/template-s	peedtool-signup	/404	/page	/wp-adm	in/post.phr	e'
		( and a daries	Juxiphip		and a signap	104	10090		and the second	۰.

#### **Queries by template**

Click the template in the list to see the full transaction trace, or if there are example traces showing at the bottom you may see a stack trace showing where your site's code is calling this query.

### EXTERNAL SERVICES

In the External services tab you'll find an overview of the external calls your site is making to other domains or URLs. If you see a large percentage of your graph on the Overview screen being taken by "Web external," this is the tab to focus on



#### **Drill Down by URL**

When you select an option from the list at the left, it will further dissect the information into throughput and time per call, as well as which template group makes each external call the most frequently. Click the template group in the bar graph to view full transaction traces from this group.

## **TOUR NEW RELIC® INSIGHTS**

In addition to New Relic APM, your license comes with access to New Relic Insights: a query system for all data stored within New Relic, to build custom reports and dashboards.



## NRQL QUERIES

Using New Relic Insights, all your site's data is stored in New Relic's database. You can use their custom query system (NRQL) to query the database and pull custom information for your own reporting. To view sample queries click Query at the top left, then navigate to Overview, Collect, Analyze, Present, or Manage to see example queries you can use to show the data you want.

### DASHBOARDS

Once you run a query, you have the option to add the query to a custom dashboard. You can create a new dashboard, or add the query to an existing dashboard to see your site's data in realtime.



## DATA EXPLORER

If you have a hard time using the NRQL query tool, you can navigate to the visual Data Explorer, where you can use the dropdown menus to select which fields you want to view and by what time frame. At the top of the screen, NRQL will update to show you the query running with each example, so you can save it for later.



# 24/7 SUPPORT FROM WP ENGINE

WP Engine is available 24/7 to help with your questions about Performance Monitoring with New Relic. As the Owner of the New Relic license, we can:

- Add users to your account\*
- Add or change alerts\*
- Change Apdex threshold\*
- Offer insights into site performance issues using APM
- Offer resources from New Relic
- General usage questions

\* indicates WP Engine Support PIN required

# **NEW RELIC® RESOURCES**

New Relic is a robust performance monitoring tool, and there are many aspects to learn if you are not familiar with the interface. Luckily, their team has provided many resources to help.

## COURSES ON LEARN.NEWRELIC.COM

New Relic offers full courses complete with video webinars, showing how to use their tools. Below are two courses which might be useful when using your New Relic license with WP Engine:

Intro to APM (1hr 40min)

Intro to Insights (57min)

## DOCUMENTATION ON DOCS.NEWRELIC.COM

In addition to the courses offered, New Relic also boasts a robust documentation site. Here you can find resources spanning their entire lineup of products, so we've provided a shortened list of articles you may find helpful when using New Relic on WP Engine.

APM page functions Apdex: Measuring user satisfaction Alert information in APM Troubleshooting password and login issues About the User role





# **About WP Engine**

WP Engine powers amazing digital experiences for websites and applications built on WordPress. The company's premium managed hosting platform provides the performance, reliability and security required by the biggest brands in the world, while remaining affordable and intuitive enough for smaller businesses and individuals. Companies of all sizes rely on WP Engine's award-winning customer service team to quickly solve technical problems and create a world-class customer experience. Founded in 2010, WP Engine is headquartered in Austin, Texas and has offices in Limerick, Ireland, San Francisco, California, San Antonio, Texas, and London, England.

www.wpengine.com

WP Engine

