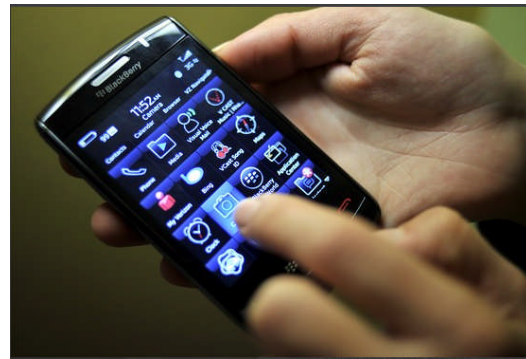


BlackBerry – OMG, It’s Déjà Vu!

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BlackBerrys have become a perceived necessity for anyone on the move – bankers, lawyers, managers, journalists, lawmakers (even President Obama has one), and anyone else “on the go.” Consequently, one would think that RIM (Research in Motion) would consider its BlackBerry services mission-critical at this point. If it did, it would be striving to achieve high-availability if not continuous availability for its email and Internet access services. But over the past five years, RIM has achieved about three 9s of availability – down for hours per year. You could do as well with your own off-the-shelf commodity email server.

Interestingly, RIM’s problems have had a common thread – upgrades. Over the past three years, RIM has suffered five major outages lasting hours each after it had tried to upgrade its BlackBerry services – particularly the BlackBerry Messenger (BBM) and BlackBerry Internet Services (BIS). These outages affected BlackBerry’s Internet browsing and email services.



Let us look at this dismal outage history.

Early Failures

BlackBerry suffered a failure in February of 2003. In June of 2005, there were two failures. During one of these latter failures, it took RIM twelve hours to acknowledge that there had been a failure and then only via a technically cryptic message.

Tuesday, April 17, 2007

At about 5 PM Pacific Time, on Tuesday, April 17, 2007, millions of BlackBerry users discovered that they were without messaging services.¹ The outage lasted until Wednesday morning, but the backlog of messages that had accumulated overnight took until Thursday to clear before service was returned to normal. This was a 24- to 48-hour outage depending upon whether you are measuring system downtime or user downtime (we define availability as service availability to the end user, making this a 48-hour outage).

RIM management did not even acknowledge that it had a problem until Wednesday morning. Once operations normalized, it reported that the outage was caused by the “introduction of a new

¹ BlackBerry Gets Juiced, *Availability Digest*, May 2007.
<http://www.availabilitydigest.com/private/0205/blackberry.pdf>

noncritical system routine” designed to optimize cache performance. Since when is messing around with cache noncritical? The change triggered a series of errors between the system’s database and cache, resulting in a temporary outage until the local backup could be brought online.

But guess what? The failover failed. It took two days to bring the system up and clear out the backlog of messages. RIM operates two Network Operating Centers (NOCs), one in Canada and one in the UK. Unfortunately, they are not configured to back each other up.

RIM’s CEO, Jim Balsillie, took to the airwaves to assure BlackBerry subscribers that this would never happen again. He said:

“It was a process error that we had that’s been fixed. It shouldn’t have happened, and it won’t happen again.”

Friday, September 7, 2007

But it did. Around 10 AM on Friday, September 7, 2007, BlackBerry messaging services failed again. RIM made no statement about this outage except that it said “Research in Motion is continuing to monitor the situation and apologizes to customers for any inconvenience.”

Slowdowns persisted into Friday night as message backlogs were cleared. RIM never made a statement as to the cause of the outage (in fact, it barely acknowledged that there had even been an outage).

Monday, February 11, 2008

At 3:30 PM Eastern Time, RIM’s email and Internet services disappeared.² Half of all North American subscribers – about four million subscribers – suddenly found their email screens empty.

This time, RIM was more forthcoming. It sent out a message that began with “This is an emergency notification regarding the current BlackBerry infrastructure outage.” The message went on to list the effects of the outage. Unfortunately, this message was sent to BlackBerry subscribers by email. They received it hours later after email services had been restored.

This outage was caused by an upgrade to RIM’s routing system. For redundancy purposes, RIM provides to its North American NOC two IP networks. RIM clients are split between these paths. The upgrade took down one path, taking out half of the North American subscribers. It seems that there was no way to switch these subscribers to the “redundant” path.

Subsequently, RIM issued a statement:

“The upgrade was part of RIM’s routine ongoing efforts to increase overall capacity for longer term growth. RIM continuously increases the capacity of its infrastructure in advance of longer term demand. Similar upgrades have been successfully implemented in the past, but there appears to be a problem with this particular upgrade that caused the intermittent service delays.”

² BlackBerry Takes Another Dive, *Availability Digest*, March 2008.
http://www.availabilitydigest.com/public_articles/0303/blackberry.pdf

Thursday, December 17, 2009

On or about December 14, 2009, RIM issued an upgrade, 5.0.0.55, to its BlackBerry Messenger instant messaging service and encouraged all subscribers to download it. A few days later, on Thursday, December 17, at about 3 AM Eastern Time, the upgrade caused BlackBerry to suffer a major outage that took down email, Internet browsing, and instant messaging across North and South America. Embarrassingly, this occurred just before RIM was scheduled to release its third-quarter results.

It again was hours before the outage was restored and the email backlog cleared up. To correct the problems caused by the .55 upgrade, RIM released a new upgrade a few days later – 5.0.0.56, – and directed its subscribers to download this upgrade.

Tuesday, December 22, 2009

Tuesday, December 22, 2009, was a busy day for email. Christmas was just three days away, and airlines had their hands full with holiday travelers being delayed by severe weather conditions.



What a bad time to find out that the 5.0.0.56 upgrade didn't correct the problem. Users in North and South America again found that they had no email service. Even users in the Asia/Pacific region (China, South Korea, Australia, Taiwan, India, and Singapore) reported problems. To compound matters, there was no message on RIM's home page, no details concerning what was going on, and no explanation of what happened on December 17. Subscribers were simply left in the dark.

RIM immediately issued upgrade version 5.0.0.57, which fortunately seems to have corrected the problem. However, it took from Tuesday to late Thursday (Christmas Eve) before email was freely flowing again. RIM then issued an explanation of sorts indicating that this pair of outages likely stemmed from a flawed BlackBerry Messenger upgrade:

"Root cause is currently under review, but based on preliminary analysis, it currently appears that the issue stemmed from a flaw in two recently released versions of BlackBerry Messenger (version 5.0.0.55 and 5.0.0.56) that caused an unanticipated database issue within the BlackBerry infrastructure. RIM has taken corrective action to restore service."

The Cost of Outages

Many BlackBerry subscribers are losing patience with RIM. A common theme of frustration was posted by one angry subscriber on BlackBerry's support site:

"Terrible. This is [the] second consecutive upgrade that was FUBAR'd for me for my Storm. Unless I get a fix quickly I'm going with the Droid, and that will end my patronage of RIM. There are times I love this phone, and times I just want to throw it against a wall."

The BlackBerry smartphone is currently the number two seller in the world, second only to Nokia's ESeries. In the U.S., it is number one, with 20% of the market. The Apple iPhone is number two, with 11% of the market; but the iPhone is rapidly gaining on the BlackBerry smartphone.

BlackBerry faces stiff competition not only from the iPhone, but also from several other competitors such as Palm's new Pre, Motorola's Droid, Google's forthcoming Nexus One, and Verizon/Microsoft's Sidekick (though Sidekick recently suffered a perhaps-fatal blow when it lost all of its subscribers' data³). As users rely more and more on smartphones as all-in-one communication devices for voice, email, texting, and Internet access, outages won't win fans.

RIM is currently in a strong competitive position. It showed a 59% increase in profits in the third quarter of 2009, during which it sold ten million phones. However, with Apple and Google breathing hard down its back with excellent availability histories (though AT&T is having trouble handling the volume created by the iPhones), this strong position could rapidly disappear.

We talk often about the cost of downtime in terms of dollars, safety, stock value, and publicity. In RIM's case, its outage history could relegate it to an "also ran."

Lessons Learned

Upgrades

Based on our many *Never Again* stories, power outages and network outages seem to lead the list of reasons that systems go down. RIM is not following this pattern. Their Achilles' heel is upgrades:

- April 17, 2007 – cache upgrade
- February 11, 2008 – routing upgrade
- December 17, 2009 – BlackBerry Messenger upgrade
- December 22, 2009 – BlackBerry Messenger upgrade

There are two fundamental rules for successful upgrades:

- Test them thoroughly.
- Be prepared to revert to the known good original system.

It seems that RIM has problems in both of these areas.

Failover

RIM has two perfectly good network operating centers. Why should they not back each other up so that if one fails, traffic can be routed through the other NOC. Of course, both NOCs would have to be configured to handle the full load; and the network would have to be capable of rerouting users. This might add a lot of cost to RIM's infrastructure, but who ever said continuous availability was cheap? Its profits increased by a whopping 59% last quarter. Divert some of that to creating a reliable infrastructure.

Communication

As pointed out in our earlier coverage, RIM continues to fail to provide rapid and thorough communications regarding problems. Good communication goes a long way towards calming the frustrated user. RIM would do well to set up a status dashboard such as Amazon's Web Services Health Dashboard (<http://status.aws.amazon.com>) or Google's Apps Status Dashboard (<http://www.google.com/appsstatus#hl=en>) to keep subscribers informed during an outage.

³ Sidekick: Your Data is in 'Danger', *Availability Digest*, November 2009.
http://www.availabilitydigest.com/public_articles/0411/sidekick.pdf

Service Backup

At the end of the day, it is incumbent upon you, the user, to make sure that you can survive a failure in any of your mission-critical services. Email is rapidly becoming mission-critical to many businesses. Do you have plans to continue operations in the event of an extended email outage? Such an outage can happen to you no matter how you distribute email – through a smartphone service, through an ISP, or through your own email server.

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