Chapter 1

Always-On Enterprise Information Systems:
The Concept, Attributes, and Implementation Drivers

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ABSTRACT

The chapter presents conceptual aspects of "always-on" information systems as well as the main attributes and implementation drivers. In addition, HP's HP-UX server operating environment which provides a possible solution platform for "always-on" information system is presented as a case.

INTRODUCTION

Modern businesses today tend to "keep business in business" and stay "always-on". Not only businesses, most organizations in today's digital age seek for such a kind of information infrastructure that is based on the "continuous computing" platform (Bajgoric, 2005, 2008) which is supported by "always-on" enterprise information system (Bajgoric, 2006, 2010). Such an information system provides, theoretically, an IT platform for a "%100" business continuance or "always-on" business. However, achieving a "%100 uptime" or "zero downtime" is not an easy task, therefore, most organizations tend to reach more realistic, but still high availability ratios in terms of "number of nines", e.g. 99,999% availability, or "near-zero downtimes", in terms of "five minutes per year" downtime. This kind of requirement is valid for all today'

client/server architectures that are in use such as "on-premises" and "cloud-based" infrastructures.

Forrester (2013) noted that "across all industries, there is less and less tolerance for any kind of downtime. According to Aberdeen Report (2014) the average cost of downtime for large companies is $686,250 per hour, $215,638/hour for medium companies and $8,581/hour for small companies. Gartner (2014) noted that, with regard to downtime costs, "Based on industry surveys, the number we typically cite is $5,600 p/minute". IDC (2015) reported "… for a large firm, the mean cost of downtime per hour is nearly $1.7 million across industries, with some specific industries approaching $10 million lost per hour of downtime."For the Fortune 1000, the average total cost of unplanned application downtime per year is $1.25 billion to $2.5 billion (IDC, 2014). Martin (2011) stated that the average data center downtime event lasts 90 minutes, and every minute the data center remains down, a company is effectively losing $5,600. The Veem Data Availability Report (2014) revealed that "...there are clear demands for 24/7 access to IT services and applications."

Table 1. presents some reports that demonstrate the downtime costs

Leitch (2016) argued that downtime has reached an estimated cost of $700 billion per year to US businesses in 2016. Ponemon Institute and Emerson Network Power (Ponemon Institute Report, 2016) reported that the average cost of a data center outage has steadily increased from $505,502 in 2010 to $740,357 today (or a 38 percent net change). However, as IDC stated (IDC, 2016) "... Business cannot tolerate the same levels of planned and unplanned downtime that they could before they started on their digital transformation journey. Niemimaa (2015) found that

Table 1. Reports on Downtime Costs

Report	Findings
Butler (2013)	A 49 minutes failure of Amazon's services on January 31, 2013 resulted close to $5 million in missed revenue.
Aberdeen Report (2014)	The average cost of downtime for large companies is $686,250 per hour, $215,638/hour for medium companies and $8,581/hour for small companies.
Gartner (2014, a)	Based on industry surveys, average downtime is $5,600 p/minute.
Avaya Report (2014)	80% percent of companies lose revenue when the network goes down.
IDC (2014)	For the Fortune 1000, the average total cost of unplanned application downtime per year is $1.25 billion to $2.5 billion.
Veem Data Availability Report (2014)	68 percent of those organizations modernizing their data centers are doing so in order to enable 24/7, always-on business operations.
IDC Report (2015)	For a large firm, the mean cost of downtime per hour is nearly $1.7 million, with some specific industries approaching $10 million lost per hour of downtime.
Ponemon Institute Report, (2016)	The average cost of a data center outage has steadily increased from $505,502 in 2010 to $740,357 today (or a 38 percent net change).

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