Chapter 4: Programmable Switches

Capitalizing on the movement in the intelligent network industry from proprietary or "hard wired" intelligence in telco-grade switches to more open, standards-based switches that can run software developed by those other than the switch manufacturer, are the programmable switch manufacturers. This small, but feisty, segment of the vendor world has a strikingly different outlook on what is needed to create IN services in both the wireless and wireline worlds and are offering their technology at prices that can't be beat.

Herbert Jackson, an analyst with Renaissance Research Group, envisions programmable switches possibly acting as the distributed switch nodes on the end of the "pipes" that may someday compose the all packet network many in the telecom world have predicted. "The smaller switching platforms are becoming so robust, that the market for programmable switches is really becoming the market for all switching," said Jackson.

The programmable switch segment of the industry consists mainly of hardware vendors who either sell the switch to a middleware vendor that places the applications on top or, in some cases, will sell a switch directly to telcos who want to put their own middleware on top. The main players in this space are Excel Switching Corp. and Summa Four Inc. and they are, as such, fiercely competitive.

…Programmable Switches: Many Faces, Many Functions

It's hard to determine exactly how large the potential is for programmable switches. Some have estimated the market to be worth at least $1 billion. But one thing is certain: There is an undeniable demand for switches that can deliver intelligent network services rapidly and that don't cost a fortune.

There are two main carrier needs that programmable switches hope to fulfill -- enhanced services and infrastructure. At least in the beginning, the biggest consumers of programmable switches are likely to be wireless carriers, which have already shown a great deal of interest.

"The first real acceptance [of programmable switches] will be from the carriers that are forward thinking. Wireless carriers certainly fit that bill," said Eric Zimits, a managing director at Hambrecht & Quist.

As an inexpensive way to build out infrastructure and provide enhanced services -- some programmable switches can be bought for as little as $25,000 -- global interest may become very strong.

"Programmable switches are very flexible for [wireless carriers]," said Dan Taylor, managing director of telecom research with the Aberdeen Group, who added that it's easier to write applications for programmable switches because they are nonproprietary. " [Wireless carriers] have been some of the biggest users of programmable switches," he added.

EXCEL AND SUMMA FOUR SCRAMBLE FOR MARKET SHARE

Two of the most visible manufacturers of straight programmable switches -- meaning the applications are developed by their customers, who sell them as enhanced services platforms to carriers -- are Summa Four Inc. and Excel Switching Corp. Because of their proximity to one another in the marketplace, Summa and Excel are fiercely competitive, scrambling to trump each other with the technological savvy of their products.

Summa Four has raised the stakes with the introduction of its new Virtual Central Office (VCO) 4K programmable switch, which supports 4,000 ports in one box. The VCO switch is priced starting at $50,000.

"That kind of capacity is what a lot of service providers are looking for," said Chris Landes, an independent consultant in Nazareth, N.J. "They want that level of scalability -- the barometer is if you can't put at least 1,000 ports per system, it won't be scaleable for a service provider. That is getting to the level of scalability that most global service providers are looking for."

Summa Four built its 4,000 port density through an input/output card that supports up to 16 spans (T-1 or E-1).

The new switch brings Summa Four into the arena of infrastructure provider rather than just an enhanced services platform manufacturer, said Peter Carlino, director of business development at Summa Four. Competitive local exchange carriers, wireless carriers, and voice over Internet protocol (IP) providers are a major part of Summa Four's target audience for the VCO. "All these networks are being built from scratch," said Carlino. "By going to 4,000 ports, we are now a legitimate infrastructure box."

The VCO switch can support applications that provide local number portability, single number, voice-activated dialing, intelligent 800, voice mail, and gateway functionality.

...Management Changes Considered Positive

The VCO switch heralded good tidings from analysts at the Renaissance Research Group, which granted Summa Four with a buy rating. The Renaissance report admitted, however, that Excel captured the lion's share of the programmable switch market from Summa Four in late 1996 due to "prior management's poor strategic decision to maintain premium pricing."

But now, the research group is bullish on Summa Four because of the higher density switch and, perhaps more importantly, the installation of CEO Bob Degan. "Prior to Degan's arrival to Summa, Excel Switching had been the better operator, keeping pace with rapid advancements in printed circuit board assembly where Summa had not," wrote Renaissance.

SWITCH VENDORS' VITAL STATISTICS

	Summa Four	Excel Switching
Market Value (as of 3/98)	$61 million	$705 million
Number of Shares	5.752 million	36.6 million
Price	$10.6875	$19.25
Revenue	$44.3 million (FYE 3/97)	$88.7 million (FYE 12/97)
Cash on Hand	$27 million	$114.9 million

Source: Renaissance Research Group

On the latest VCO switch, Renaissance said: "When Summa talks about delivering the highest number of ports, it is in a single switch, which sets new industry benchmarks for capacity in programmable switches. Excel claims that it has deployed larger 16,000-port switches, but these 16,000-port solutions are really eight 2,000-port switches linked together -- which present network management problems which their value-added resellers/application developers must solve. Additionally, Excel's price per port is higher than Summa's."

As far as Excel is concerned, however, its 16,000-port switch package would not cause problems with network management. Excel's Product Marketing Manager Mike Toomey said that, while it's true the switches are connected by a fiber ring called Exnet, the switch modules are in a "fully nonblocking arrangement," which allows for greater scalability. "You're not repeating a lot of the common equipment as you grow from module to module," Toomey added. For example, extra hardware would not be necessary to connect the switches to the SS7 network.

Hambrecht & Quist's Zimits, who helped underwrite Excel's initial public offering last year, also disagrees that Summa will take away market share from Excel because of its VCO switch. "At the end of the day, it's just not the port density," said Zimits. "Excel has a dominant share of the market relative to Summa's."

SWITCHES USED TO SUPPORT DIVERSE MIDDLEWARE

Priority Call Management, a privately owned developer of enhanced services platforms, agrees that high port density does not necessarily make the programmable switch. Priority Call bases its applications on an Excel switch and recently unveiled enhancements to its platform that include Excel's Exnet Connect technology, which is basically a SONET-like fiber ring located inside the switch rather than using T-1 or E-1.

"I'm using fiber to connect my voice ports," said Andrew Ory, founder and CEO of Priority Call. "The Excel switch is at the center of this platform."

Priority's other new platform enhancements include a channelized database and IS-41 messaging. The channelized database is an external, open database, similar to an Oracle database, that also includes an internal, proprietary database as a back-up method. "Right now, everybody has a proprietary database," said Ory. "Now, carriers can have their cake and eat it, too." The IS-41 messaging capabilities integrate the platform into the cellular world, leveraging prepaid services with cellular roaming and other wireless intelligent network applications.

...New Platform Expected at Year's End

The intelligent network applications on Priority's platform all belong to the ORYX family. OryxCALL enables prepaid services and debit cards; oryxMESSAGE allows for the creation of voice, fax, and electronic messaging, as well as paging and short message service; and oryxONE is its one number software application, with features such as simultaneous ringing of multiple phones, meet me paging, caller identification, cellular safeguard, and connect to caller in voice mail. The new enhancements to the Priority Call platform are scheduled for shipment at the end of 1998.

Ory said the latest IS-41 enhancement is geared toward upgrading the single number application. "Single number is strategic for carriers, because they can integrate widely diverse services to a single customer," said Ory "This service will become more valuable as the technology becomes more transparent."

STUDY EXAMINES PROFIT POTENTIAL, VERTICAL MARKETS

Perhaps because it is still so young, not much in the way of independent studies have been conducted on the programmable switch market. However, a study that Excel commissioned Frost & Sullivan to conduct in order to gauge the market potential for its products concludes that there is definitely growth in store for programmable switches.

The Worldwide Programmable Switch Market (in $ millions)

1997	1998	1999	2000
$295	$413	$569.9	$775.1

Source: Frost & Sullivan

As Frost & Sullivan determined in its study for Excel, worldwide revenues from programmable switches were $295 million in 1997. From 1998 to 2000, the study projects revenues will rise from $413 million to $775.1 million (see above chart).

According to the study, demand drivers for programmable switches include: Greater demand for enhanced services in both IN and non-IN arenas; a need for wireless and wireline infrastructure in developing countries, such as those in southern Asia, central and Latin America, and eastern Europe; advances in middleware technology; and increased demand for mobile computing platforms and virtual offices.

"There is all-around growth in the demand for programmable switches worldwide," stated the study. "Wireline infrastructure is being built in most of the developing countries, where nearly 70 percent of the population has no access to a telephone. Demand for programmable switches in these areas is quite strong and is likely to grow at a very high rate."

...Vertical Market Trends

The Frost & Sullivan study analyzes the revenue trends of programmable switches by each of the following vertical markets: Wireline and wireless infrastructure, call centers, and enhanced service platforms. Of these, the fastest growing segment is the enhanced services market, which are no longer luxury items, but essential elements to fatten the bottom line of service providers. In 1995, worldwide revenues of programmable switches used as enhanced service platforms were $43.8 million. By 2000, that figure is expected to reach $275.1 million.