"QuickVC" IP Exchange via the Internet

A Standards-Based Industry Collaboration

QuickVC

Several companies and organizations, including the Nokia Research Center, RAPID, Silicon Integration Initiative (Si2), Synchronicity, and the Virtual Component Exchange (VCX), have collaborated to develop QuickVC, a working prototype for standards-based VC information exchange across the System-on-Chip (SoC) industry.

The objective of the QuickVC program is to develop more productive methods for SoC design engineers to search for, evaluate, and integrate virtual components into their designs. This new standards-based approach resolves many issues incumbent in today's process, with the overall goal of significantly reducing time to market.

QuickVC includes a pilot system designed to improve this process. This pilot system, based on ECIX QuickData technology and the eXtensible Markup Language (XML), allows engineers to send a single query to multiple suppliers selected from a "registry" of participants. Engineers can expect standard responses to be returned by compliant providers who are registered.

Participants

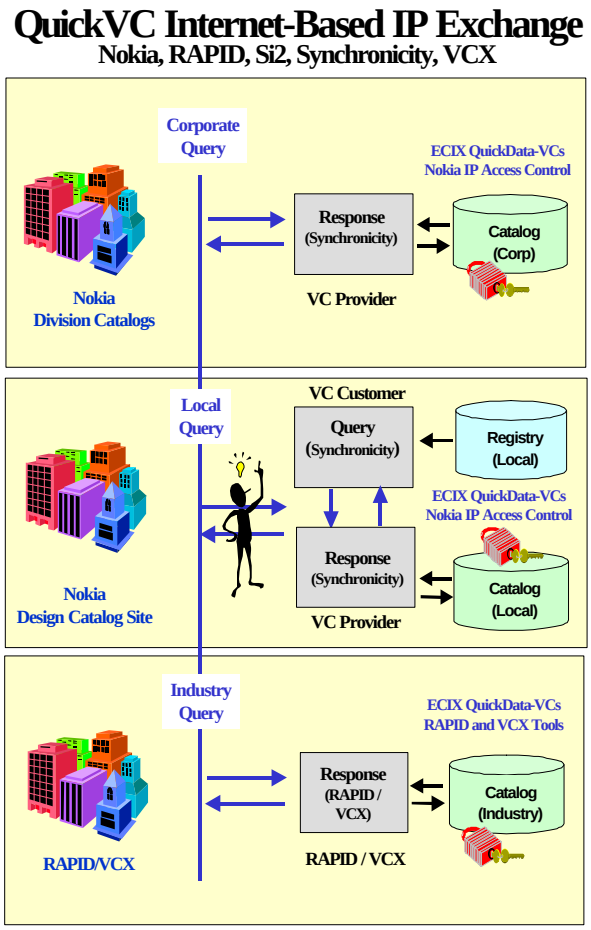
The following companies and organizations have collaborated on this project. Each participant's role is provided in parenthesis:

- Nokia Research Center (Customer)
- RAPID (Catalog Product Provider)
- Si2 (ECIX QuickData Protocol and QuickVC Specification and Project Management)
- Synchronicity (Customer Software Provider and RAPID Catalog Software Provider)
- VCX (VC Listing, Controlled Access Technology and Business and Legal Tools for IP transaction)

The attributes selected for the QuickVC query and response transactions were obtained from the Virtual Socket Interface Alliance (VSIA) Virtual Component Transfer Development Working Group (VCT DWG) Attribute Description Document. The selected attributes form the base for the QuickVC Specification that is used in the pilot.

QuickVC in Action

The QuickVC system enables SoC engineers to generate standard queries to VC information and catalog providers. These queries, in the form of ECIX QuickVC XML, can be sent real-time over the Internet to any QuickVC-compliant information provider.



Searching for VCs

In the QuickVC program, the SoC engineer would compose a query in search of a VC with certain attributes as shown in the following table. For example, a query might search for a VC which is in a class of "Viterbi", a market segment of "communications" OR "consumer", a hardness of "soft", a maximum gate count of "30K", and compliant standard "ETS 300 401".

Customer DUNS	ID of querying entity. (required: query/response).
Supplier DUNS	ID of responding entity. Acquired by selecting the appropriate supplier in the Registry. (required: query/ response).
Key Text	Customers may query upon any key words deemed appropriate for the search. Suppliers may include up to 256 characters in this field (required: response).
Function/Class	Describes the general functional behavior category or classification of a VC (required: response).
Compliant Standard	Standard to which VC is intended to comply (required: response).
Form Information/ Hardness	Distinguishes the integration and adoption process of one VC from another. VC creator should clearly state the hardness of the VC as all VSIA specifications are based on this criteria (required: response).
Form Information/ Gate count	The equivalent number of gates in units of the ASIC NAND gate cell in a particular library in which the VC has been verified. (optional: response).

Customer Query Generation

In a typical engineering scenario inside Nokia (which may be similar at other companies), the search begins with a search in the "local" Nokia design catalog (note: all queries in the QuickVC pilot use software powered by Synchronicity). If the desired VC is found locally, then that VC is used.

When the desired VC cannot be found locally, then the engineer may search the "corporate" catalog(s) for the VC. In the pilot, the corporate query is sent to a catalog powered by Synchronicity software. Again, if the desired VC is found, it is used.

When the desired VC is not available inside Nokia, the query can be sent to outside VC catalog or information provider sites (such as those provided by RAPID, or VCX).

The QuickVC paradigm enables a single query to be issued to any (or all) of the available VC provider sites, by selecting the desired sites from a "registry" of potential search sites prior to sending the query. The QuickVC XML for the query is then sent to the selected provider sites.

Once specific VC providers and VC identification are known, publicly accessible information such as datasheets may be requested and delivered.

Provider Query/Response Handling

The selected VC information provider or catalog sites then receive the query from the customer, understand what is being asked for, and then proceed to seek matches to the query in their VC repertoire. For each case where there is a match, a QuickVC XML response is generated. If no match is found, a response is generated with the appropriate QuickVC XML "no match" message.

In the QuickVC program, the following VC catalog or information provider companies provided a QuickVC interface to handle these standard queries:

- RAPID (VC Catalog)
- VCX (VC Listing Service)

Customer Response Handling

When VC provider sites have responded to the QuickVC query, the Nokia search software will process the QuickVC responses, and react accordingly. In the pilot program, the Nokia engineer (again using Synchronicity software) may see responses from each of the VC information provider sites (Nokia local, Nokia corporate, and Nokia-external information providers) on a single screen for comparison purposes. The information in each matching QuickVC response will include selected attributes designated as "mandatory" in responses to a query. See the QuickVC Specification (v0.9) for details.

With QuickVC technology, the engineer is able to build a query, send the query to one or more VC information sites, and receive responses to his query, all at Internet speed.

The participants in the QuickVC program anticipate announcement of final specifications and commercial products based on QuickVC specifications to be announced by June 2000 at the Design Automation Conference in Los Angeles. Draft QuickVC version 0.9 specifications are available now on the ECIX web site.

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