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Sibert

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(54) **SYSTEMS AND METHODS FOR USING CRYPTOGRAPHY TO PROTECT SECURE AND INSECURE COMPUTING ENVIRONMENTS**

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(57) **ABSTRACT**

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(58) **Field of Classification Search** **719/331; 713/201, 179; 62/259.2; 324/760**
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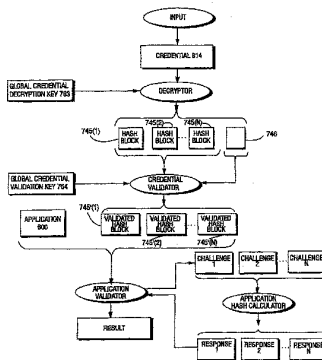
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27 Claims, 28 Drawing Sheets

Computation environments are protected from bogus or rogue load modules, executables, and other data elements through use of digital signatures, seals, and certificates issued by a verifying authority. A verifying authority—which may be a trusted independent third party—tests the load modules and/or other items to verify that their corresponding specifications are accurate and complete, and then digitally signs them based on a tamper resistance work factor classification. Secure computation environments with different tamper resistance work factors use different digital signature authentication techniques (e.g., different signature algorithms and/or signature verification keys), allowing one tamper resistance work factor environment to protect itself against load modules from another tamper resistance work factor environment. The verifying authority can provide an application intended for insecure environments with a credential having multiple elements covering different parts of the application. To verify the application, a trusted element can issue challenges based on different parts of the authenticated credential that the trusted element selects in an unpredictable (e.g., random) way, and deny service (or take other appropriate action) if the responses do not match the authenticated credential.



EXAMPLE CREDENTIAL VALIDATION

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