Programming Embedded Device Platforms for Internet Connectivity

- Using the Ethernet and WiFi Libraries

- Using IP Library

- Using Cryptographic Library

- Adding Security and Authentication

- Data Encryption and Decryption

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Using the Ethernet and WiFi Libraries

Arduino Ethernet Library and header files in the library enable the usage of Serial IO functions between Arduino SPI port, IO utility, Ethernet shield, Ethernet client, Ethernet server, DNS and UDP protocol functions.

Using IP Library

IP library is used when a set of built-in codes and the codes which enable use of the functions of the library for creating stack for the TCP/IP protocols based communication are needed.

Examples of IP library functions are

(i) lwIP (lightweight Internet Protocol) which enables TCP/IP communication with the little memory requirements.

(ii) (ii) uIP (micro Internet protocol) library functions enable TCP/IP communication with very little memory requirements.

Using Cryptographic Library

- Security of data from embedded device platforms is of high importance in web applications and services.

Adding Security and Authentication

- Securing Communication of Authentication Code (Secret Key) Security adds by communicating hash of Al or secret key (a text string) in place of communicating plain text string.

- A function, called hash function creates a fixed length string, called hash of the input string, for example of Al.

- The H(A1) uses the original string, say Al. User communicates H(A1) in place of original Al.

Data Encryption and Decryption

- Data needs protection from read and use by an in-between system. Encryption ensures the protection needs.

- Uses of standard algorithms, such as AES128, AES192, AES256 or DES enable the encryption and decryption.

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Thank You

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